**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #6 - Design-CNMP Revision

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be revised to address changes in manure management, volume or analysis, plants and crops, or plant and crop management or to adjust the nutrient balance on an Animal Feeding Operation (AFO). No modifications are required to engineered practices in the farmstead/production area. This scenario is where the services of a professional engineer are typically not required. The producer may export manure or organic products from the farm. The producer has an animal production area and land applies nutrients.

**Before Situation:**

The owner/operator of an AFO has an existing written Comprehensive Nutrient Management Plan (CNMP) that addresses the current required resource concerns and client objectives present on the facility production area and land application areas. The CNMP is out of date or does not meet current needs or objectives. Various levels of management and conservation implementation have changed on the operation. Soil tests, manure analyses, or changes in cropping system require that the nutrient balance be adjusted to bring the CNMP up to date.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,844.20

**Scenario Cost/Unit:** $4,844.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 40 | $4,326.00 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 5 | $518.20 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #22 - Design- Livestock Operations greater than 300 AU without Land Application and Minimal Engineering

**Scenario Description:**

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). No State requirement for Professional Engineer.

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,929.80

**Scenario Cost/Unit:** $4,929.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 36 | $3,893.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 10 | $1,036.40 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #38 - Design- Dairy less than 300 AU Land Application

**Scenario Description:**

Dairy Animal Feeding Operation (AFO) currently less than 300 animal units (AU) land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $10,634.60

**Scenario Cost/Unit:** $10,634.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 60 | $6,489.00 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 40 | $4,145.60 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #54 - Design- Dairy greater than 300 AU and less than 700 AU with Land Application

**Scenario Description:**

Dairy Animal Feeding Operation (AFO) currently greater than 300 animal units (AU) and less than 700 AU with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,283.50

**Scenario Cost/Unit:** $11,283.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 66 | $7,137.90 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 40 | $4,145.60 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #70 - Design- Non Dairy Operation greater than 300 AU and less than 700 AU with Land Application

**Scenario Description:**

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU) and less than 700 AU with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $10,652.64

**Scenario Cost/Unit:** $10,652.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 64 | $6,921.60 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 36 | $3,731.04 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #86 - Design- Non Dairy Operation Less than 300 AU with Land Application

**Scenario Description:**

Animal Feeding Operation (AFO) currently less than 300 animal units (AU) with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,503.58

**Scenario Cost/Unit:** $9,503.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 62 | $6,705.30 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 27 | $2,798.28 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #102 - Design- Non Dairy Operation greater 700 AU with Land Application

**Scenario Description:**

Animal Feeding Operation (AFO) currently greater than 700 animal units (AU) with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,779.56

**Scenario Cost/Unit:** $12,779.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 76 | $8,219.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 44 | $4,560.16 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #118 - Design- Small Livestock Operations less than 300 AU without Land Application

**Scenario Description:**

Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,867.39

**Scenario Cost/Unit:** $6,867.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 29 | $3,136.35 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 36 | $3,731.04 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #134 - Design- Livestock Operations greater than 300 AU without Land Application

**Scenario Description:**

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,475.70

**Scenario Cost/Unit:** $7,475.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 26 | $2,811.90 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 45 | $4,663.80 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #150 - Design- Small Livestock Operations greater than 300 AU with Land Application and Minimal Engineering

**Scenario Description:**

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU) with land application and minimal engineering. The producer exports (material transferred to another owner with written documentation of the transfer) modest amounts of manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). State laws do not require a PE.

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,728.58

**Scenario Cost/Unit:** $8,728.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 74 | $8,003.10 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 7 | $725.48 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #166 - Design- Small Livestock Operations less than 300 AU with Land Application and Minimal Engineering

**Scenario Description:**

Animal Feeding Operation (AFO) currently less than 300 animal units (AU) with land application and minimal engineering. The producer exports (material transferred to another owner with written documentation of the transfer) modest amounts of manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). State laws do not require a PE.

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,876.50

**Scenario Cost/Unit:** $6,876.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 54 | $5,840.10 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 10 | $1,036.40 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #182 - Design- Livestock Operations less than or equal to 300 AU without Land Application and Minimal Engineering

**Scenario Description:**

Animal Feeding Operation (AFO) currently less than or equal to 300 animal units (AU) with land application and minimal engineering. The producer exports (material transferred to another owner with written documentation of the transfer) modest amount of manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). No State requirement for Professional Engineer.

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,660.20

**Scenario Cost/Unit:** $6,660.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 52 | $5,623.80 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 10 | $1,036.40 |

**Practice:** 101 - CNMP Design and Implementation Activity

**Scenario** #198 - Design- Dairy greater than or equal to 700 AU with Land Application

**Scenario Description:**

Dairy Animal Feeding Operation (AFO) currently greater than or equal to 700 animal units (AU) with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

**After Situation:**

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,572.28

**Scenario Cost/Unit:** $12,572.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 76 | $8,219.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 42 | $4,352.88 |

**Practice:** 102 - Comprehensive Nutrient Management Plan

**Scenario** #352 - Planning Dairy Greater than 300 AU, less than 700 AU with Land

**Scenario Description:**

Dairy Animal Feeding Operation (AFO) greater than 300 but less than 700 animal units (AU) animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land application areas remain to be addressed through the development of a complete CPA-CNMP.

**After Situation:**

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,401.00

**Scenario Cost/Unit:** $9,401.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 50 | $5,182.00 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 50 | $4,219.00 |

**Practice:** 102 - Comprehensive Nutrient Management Plan

**Scenario** #368 - Planning Dairy Less than 300 AU with Land

**Scenario Description:**

Dairy Animal Feeding Operation (AFO) currently is less than 300 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land application areas remain to be addressed through the development of a complete CPA-CNMP.

**After Situation:**

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,942.70

**Scenario Cost/Unit:** $7,942.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 40 | $4,145.60 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 45 | $3,797.10 |

**Practice:** 102 - Comprehensive Nutrient Management Plan

**Scenario** #384 - Planning Livestock Greater than 300 AU, No-Land

**Scenario Description:**

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) all manure or organic products from the farm. The operation has an animal production area only.

**Before Situation:**

Currently the production area does not meet NRCS quality criteria for water quality. Manure or Organic products are not frequently tested. The production area does not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CPA-CNMP.

**After Situation:**

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and transfer of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,002.60

**Scenario Cost/Unit:** $7,002.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 35 | $3,627.40 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 40 | $3,375.20 |

**Practice:** 102 - Comprehensive Nutrient Management Plan

**Scenario** #400 - Planning Livestock Less than 300 AU, No-Land

**Scenario Description:**

Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) all manure or organic products from the farm. The operation has an animal production area only.

**Before Situation:**

Currently the production area does not meet NRCS quality criteria for water quality. Manure or Organic products are not frequently tested. The production area does not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CPA-CNMP.

**After Situation:**

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and transfer of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,122.40

**Scenario Cost/Unit:** $5,122.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 25 | $2,591.00 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 30 | $2,531.40 |

**Practice:** 102 - Comprehensive Nutrient Management Plan

**Scenario** #416 - Planning Livestock Greater than 700 AU with Land

**Scenario Description:**

Animal Feeding Operation (AFO) currently is greater than 700 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CPA-CNMP.

**After Situation:**

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $10,666.70

**Scenario Cost/Unit:** $10,666.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 50 | $5,182.00 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 65 | $5,484.70 |

**Practice:** 102 - Comprehensive Nutrient Management Plan

**Scenario** #432 - Planning Livestock Greater than 300 AU, less than 700 AU with Land

**Scenario Description:**

Animal Feeding Operation (AFO) currently is greater than 300 but less than 700 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CPA-CNMP.

**After Situation:**

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,786.50

**Scenario Cost/Unit:** $8,786.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 40 | $4,145.60 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 55 | $4,640.90 |

**Practice:** 102 - Comprehensive Nutrient Management Plan

**Scenario** #448 - Planning Livestock Less than 300 AU with Land

**Scenario Description:**

Animal Feeding Operation (AFO) currently is less than 300 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CPA-CNMP.

**After Situation:**

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP identifies the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,530.26

**Scenario Cost/Unit:** $6,530.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 28 | $2,901.92 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 43 | $3,628.34 |

**Practice:** 102 - Comprehensive Nutrient Management Plan

**Scenario** #464 - Planning Dairy Greater than 700 AU with Land

**Scenario Description:**

Dairy Animal Feeding Operation (AFO) greater than 700 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

**Before Situation:**

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land application areas remain to be addressed through the development of a complete CPA-CNMP.

**After Situation:**

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,799.40

**Scenario Cost/Unit:** $11,799.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 65 | $6,736.60 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 60 | $5,062.80 |

**Practice:** 106 - Forest Management Plan

**Scenario** #23 - FMP Less Than or Equal to 20 acres

**Scenario Description:**

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,596.00

**Scenario Cost/Unit:** $1,596.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 19 | $1,596.00 |

**Practice:** 106 - Forest Management Plan

**Scenario** #24 - FMP 21 to 100 acres

**Scenario Description:**

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,352.00

**Scenario Cost/Unit:** $2,352.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 28 | $2,352.00 |

**Practice:** 106 - Forest Management Plan

**Scenario** #26 - FMP 101 to 250 acres

**Scenario Description:**

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,864.00

**Scenario Cost/Unit:** $3,864.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 46 | $3,864.00 |

**Practice:** 106 - Forest Management Plan

**Scenario** #27 - FMP Greater Than 1000 acres

**Scenario Description:**

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,072.00

**Scenario Cost/Unit:** $9,072.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 108 | $9,072.00 |

**Practice:** 106 - Forest Management Plan

**Scenario** #29 - FMP 251 to 500 acres

**Scenario Description:**

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CPA). The CPA requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan requirements are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,712.00

**Scenario Cost/Unit:** $5,712.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 68 | $5,712.00 |

**Practice:** 106 - Forest Management Plan

**Scenario** #31 - FMP 501 to 1000 acres

**Scenario Description:**

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,972.00

**Scenario Cost/Unit:** $6,972.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 83 | $6,972.00 |

**Practice:** 110 - Grazing Management Plan

**Scenario** #72 - Conservation Plan for Grazed Lands 101 to 500 acres

**Scenario Description:**

Site specific conservation plan for grazed lands for an agricultural operation with 101 to 500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and idenify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferrred Alternative).

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,068.40

**Scenario Cost/Unit:** $3,068.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 30 | $3,068.40 |

**Practice:** 110 - Grazing Management Plan

**Scenario** #88 - Conservation Plan for Grazed Lands <100 acres.

**Scenario Description:**

Site specific conservation plan for agricultural operation with less than 100 acres grazed land. The plan will address the following natural resource concerns: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and identify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,454.72

**Scenario Cost/Unit:** $2,454.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 24 | $2,454.72 |

**Practice:** 110 - Grazing Management Plan

**Scenario** #104 - Conservation Plan for Grazed Lands 501 to 1,500 acres

**Scenario Description:**

Site specific conservation plan for grazed lands for an agricultural operation with 501 to 1,500 acres of grazed land. The plan will address the following natural resource concerns: soil erosion, water quality, fish and wildlife, plant condition and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and idenify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferrred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,682.08

**Scenario Cost/Unit:** $3,682.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 36 | $3,682.08 |

**Practice:** 110 - Grazing Management Plan

**Scenario** #120 - Conservation Plan for Grazed Lands 1,501 to 5,000 acres

**Scenario Description:**

Site specific conservation plan for grazed lands for an agricultural operation with 1,501 to 5,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and idenify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferrred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,295.76

**Scenario Cost/Unit:** $4,295.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 42 | $4,295.76 |

**Practice:** 110 - Grazing Management Plan

**Scenario** #136 - Conservation Plan for Grazed Lands 5,001 to 10,000 acres

**Scenario Description:**

Site specific conservation plan for grazed lands for an agricultural operation with 5,001 to 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and idenify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferrred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,909.44

**Scenario Cost/Unit:** $4,909.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 48 | $4,909.44 |

**Practice:** 110 - Grazing Management Plan

**Scenario** #152 - Conservation Plan for Grazed Lands >10,000 acres

**Scenario Description:**

Site specific conservation plan for grazed lands for an agricultural operation with greater than 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and identify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,523.12

**Scenario Cost/Unit:** $5,523.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 54 | $5,523.12 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #86 - Organic Crops + Livestock, <5

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,868.92

**Scenario Cost/Unit:** $2,868.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 34 | $2,868.92 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #102 - Organic Crops, 5 or more

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,700.16

**Scenario Cost/Unit:** $2,700.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 32 | $2,700.16 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #118 - Small Farm

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for a small farm (<10 acres).

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,687.60

**Scenario Cost/Unit:** $1,687.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 20 | $1,687.60 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #134 - Organic Crops + Livestock, 5 or more

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,037.68

**Scenario Cost/Unit:** $3,037.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 36 | $3,037.68 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #150 - Crops+Livestock, 5 or more

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,531.40

**Scenario Cost/Unit:** $2,531.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 30 | $2,531.40 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #166 - Crops+Livestock, <5

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,025.12

**Scenario Cost/Unit:** $2,025.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 24 | $2,025.12 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #182 - Organic Crops, <5

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,193.88

**Scenario Cost/Unit:** $2,193.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 26 | $2,193.88 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #198 - Crops, 5 or more

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,362.64

**Scenario Cost/Unit:** $2,362.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 28 | $2,362.64 |

**Practice:** 116 - Soil Health Management Plan

**Scenario** #214 - Crops, <5

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,856.36

**Scenario Cost/Unit:** $1,856.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 22 | $1,856.36 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #6 - High Complexity, 6+ Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $10,762.74

**Scenario Cost/Unit:** $10,762.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 78 | $8,083.92 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 15 | $757.50 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 6 | $198.12 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 24 | $1,723.20 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #22 - Medium Complexity, 6+ Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, “6+ Designs” shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,291.94

**Scenario Cost/Unit:** $9,291.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 66 | $6,840.24 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 14 | $707.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 5 | $165.10 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 22 | $1,579.60 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #38 - Low Complexity, 6+ Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, "6+ Designs" shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,821.14

**Scenario Cost/Unit:** $7,821.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 54 | $5,596.56 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 13 | $656.50 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 20 | $1,436.00 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #54 - High Complexity, 4-5 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,148.34

**Scenario Cost/Unit:** $9,148.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 66 | $6,840.24 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 14 | $707.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 5 | $165.10 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 20 | $1,436.00 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #70 - Medium Complexity, 4-5 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, “4-5 Designs” shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,677.54

**Scenario Cost/Unit:** $7,677.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 54 | $5,596.56 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 13 | $656.50 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 18 | $1,292.40 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #86 - Low Complexity, 4-5 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, "4-5 Designs" shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,206.74

**Scenario Cost/Unit:** $6,206.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 42 | $4,352.88 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 12 | $606.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 16 | $1,148.80 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #102 - High Complexity, 2-3 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,533.94

**Scenario Cost/Unit:** $7,533.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 54 | $5,596.56 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 13 | $656.50 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 16 | $1,148.80 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #118 - Medium Complexity, 2-3 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each “Design” indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, “2-3 Designs” shall be contracted for theAg Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,063.14

**Scenario Cost/Unit:** $6,063.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 42 | $4,352.88 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 12 | $606.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 14 | $1,005.20 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #134 - Low Complexity, 2-3 Designs

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a "Low Complexity" system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. "Low Complexity" practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each "Design" indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, "2-3 Designs" shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client's final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client's decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,592.34

**Scenario Cost/Unit:** $4,592.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 30 | $3,109.20 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 11 | $555.50 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 12 | $861.60 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #150 - High Complexity, 1 Design

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “High Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) “High Complexity” practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,919.54

**Scenario Cost/Unit:** $5,919.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 42 | $4,352.88 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 12 | $606.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 12 | $861.60 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #166 - Medium Complexity, 1 Design

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a “Medium Complexity” system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) “Medium Complexity” practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,448.74

**Scenario Cost/Unit:** $4,448.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 30 | $3,109.20 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 11 | $555.50 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 10 | $718.00 |

**Practice:** 120 - Agricultural Energy Design

**Scenario** #182 - Low Complexity, 1 Design

**Scenario Description:**

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a “Low Complexity” system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. “Low Complexity” practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. “One Design” indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client’s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client’s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,977.94

**Scenario Cost/Unit:** $2,977.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 18 | $1,865.52 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 10 | $505.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 1 | $33.02 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 8 | $574.40 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition

**Scenario** #6 - Conservation Plan Supporting Organic Transition CAP Crops and Livestock

**Scenario Description:**

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

**Before Situation:**

Agricultural operation currently managed using traditional and conventional methods for farming and/or ranching mixed operation of crops and livestock. The producer currently manages the operation based upon personal knowledge, or other local criteria. The producer is interested in transitioning part or all of the management unit to meet national USDA requirements for a certified operation. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,328.50

**Scenario Cost/Unit:** $6,328.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 75 | $6,328.50 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition

**Scenario** #7 - Conservation Plan Supporting Organic Transition CAP Crops or Livestock

**Scenario Description:**

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

**Before Situation:**

Agricultural operation currently managed using traditional and conventional methods for farming with only crops. The producer currently manages the operation based upon personal knowledge, or other local criteria. The producer is interested in transitioning part or all of the management unit to meet national USDA requirements for certified operation. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,400.32

**Scenario Cost/Unit:** $5,400.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 64 | $5,400.32 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition

**Scenario** #38 - Transition to Organic- Crop, Low Complexity

**Scenario Description:**

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic production systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

**Before Situation:**

Current crops and rotation, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current cropping system are not known and new resource concerns may emerge.

**After Situation:**

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,484.70

**Scenario Cost/Unit:** $5,484.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 65 | $5,484.70 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition

**Scenario** #54 - Transition to Organic- Crop, High Complexity

**Scenario Description:**

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic production systems. Crop production system is more complex based on site features, large acreage, specialty crops, irrigation, orchard and vineyards. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

**Before Situation:**

Current crops and rotation, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current cropping system are not known and new resource concerns may emerge.

**After Situation:**

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,328.50

**Scenario Cost/Unit:** $6,328.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 75 | $6,328.50 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition

**Scenario** #70 - Transition to Organic-Livestock, Low Complexity

**Scenario Description:**

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic livestock systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

**Before Situation:**

Current livestock production, housing, feed, equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current system are not known and new resource concerns may emerge.

**After Situation:**

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,906.60

**Scenario Cost/Unit:** $5,906.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 70 | $5,906.60 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition

**Scenario** #86 - Transition to Organic-Livestock, High Complexity

**Scenario Description:**

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic livestock systems. System is high complexity based on conditions such as large Animal Units, multiple production locations, age segregation and similar management. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

**Before Situation:**

Current livestock production, housing, feed, equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current system are not known and new resource concerns may emerge.

**After Situation:**

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,823.20

**Scenario Cost/Unit:** $8,823.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 20 | $2,072.80 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 80 | $6,750.40 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition

**Scenario** #102 - Transition to Organic- Crop and Livestock, Low Complexity

**Scenario Description:**

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic crop and livestock production systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

**Before Situation:**

Current crops and rotation, livestock management and feeding, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current cropping system are not known and new resource concerns may emerge.

**After Situation:**

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,328.50

**Scenario Cost/Unit:** $6,328.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 75 | $6,328.50 |

**Practice:** 138 - Conservation Plan Supporting Organic Transition

**Scenario** #118 - Transition to Organic- Crop and Livestock, High Complexity

**Scenario Description:**

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic crop and livestock production systems. Increased crop acreage, irrigation, specialty crops, orchards and vineyards, large AUs, age segregation management add complexity to the system. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

**Before Situation:**

Current crops and rotation, livestock management and feeding, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current cropping system are not known and new resource concerns may emerge.

**After Situation:**

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,245.10

**Scenario Cost/Unit:** $9,245.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 20 | $2,072.80 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 85 | $7,172.30 |

**Practice:** 140 - Transition to Organic Design

**Scenario** #6 - Low Complexity 1-4 CPS

**Scenario Description:**

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resource concerns with 1 - 4, low complexity conservation practices.

**Before Situation:**

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. Low complexity conservation practices may include: cover crop, crop rotation, reduced tillage, conservation plantings and minor structural practices for erosion control such as grass waterways and diversions.

**After Situation:**

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,837.78

**Scenario Cost/Unit:** $4,837.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 16 | $1,730.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 16 | $1,350.08 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |

**Practice:** 140 - Transition to Organic Design

**Scenario** #22 - Low Complexity, 5+ CPS

**Scenario Description:**

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resources concerns with 5 or more conservation practices with low complexity.

**Before Situation:**

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. Low complexity conservation practices may include: cover crop, crop rotation, reduced tillage, conservation plantings and minor structural practices for erosion control such as grass waterways and diversions.

**After Situation:**

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,609.52

**Scenario Cost/Unit:** $9,609.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 32 | $3,460.80 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 32 | $3,316.48 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 32 | $2,700.16 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |

**Practice:** 140 - Transition to Organic Design

**Scenario** #38 - High Complexity, 1 -4 CPS

**Scenario Description:**

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants, and Animals. Will address resource concerns with 1 - 4, high complexity conservation practices.

**Before Situation:**

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. High complexity conservation practices may include: management practices for nutrients, pests, grazing, irrigation etc. and structural practices such as waste storage facility and wetland practices.

**After Situation:**

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,437.62

**Scenario Cost/Unit:** $12,437.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 40 | $4,326.00 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 40 | $4,145.60 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 40 | $3,375.20 |
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 8 | $491.76 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |

**Practice:** 140 - Transition to Organic Design

**Scenario** #54 - High Complexity, 5+ CPS

**Scenario Description:**

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resource concerns with 5 or more, high complexity conservation practices.

**Before Situation:**

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. High complexity conservation practices may include: management practices for nutrients, pests, grazing, irrigation etc. and structural practices such as waste storage facility and wetland practices.

**After Situation:**

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $16,042.88

**Scenario Cost/Unit:** $16,042.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 56 | $6,056.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 40 | $4,145.60 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 56 | $4,725.28 |
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 16 | $983.52 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |

**Practice:** 144 - Fish and Wildlife Habitat Design

**Scenario** #6 - Fish & Wildlife Habitat DIA

**Scenario Description:**

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to only one land use on the agricultural operation.

**Before Situation:**

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or water features for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the DIA criteria and NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Design & Implementation Plan

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,201.84

**Scenario Cost/Unit:** $3,201.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $88.94 | 36 | $3,201.84 |

**Practice:** 144 - Fish and Wildlife Habitat Design

**Scenario** #22 - Fish & Wildlife Habitat DIA (2 Land Uses)

**Scenario Description:**

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to two land uses on the agricultural operation of which each land use is at least 20 acres in size.

**Before Situation:**

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or water features for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the DIA criteria and NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Fish and Wildlife Habitat DIA

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,913.36

**Scenario Cost/Unit:** $3,913.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $88.94 | 44 | $3,913.36 |

**Practice:** 144 - Fish and Wildlife Habitat Design

**Scenario** #38 - Fish & Wildlife Habitat DIA (3 or More Land Uses)

**Scenario Description:**

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to three or more land uses on the agricultural operation of which at least three of the land uses are at least 20 acres in size.

**Before Situation:**

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or water features for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the DIA criteria and NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Fish and Wildlife Habitat DIA

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,624.88

**Scenario Cost/Unit:** $4,624.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $88.94 | 52 | $4,624.88 |

**Practice:** 148 - Pollinator Habitat Design

**Scenario** #6 - Pollinator Habitat Enhancement Plan CAP - No Local TSP

**Scenario Description:**

Various on-farm land uses, No qualified TSP within 300 miles. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

**Before Situation:**

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,425.34

**Scenario Cost/Unit:** $5,425.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $88.94 | 61 | $5,425.34 |

**Practice:** 148 - Pollinator Habitat Design

**Scenario** #22 - Pollinator Habitat Enhancement Plan CAP

**Scenario Description:**

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

**Before Situation:**

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,735.48

**Scenario Cost/Unit:** $3,735.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, biologist | 1298 | Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price). | Hours | $88.94 | 42 | $3,735.48 |

**Practice:** 157 - Nutrient Management Design and Implementation Activity

**Scenario** #6 - Design Nutrient Management for greater than 101 Acres and less than or equal to 300 Acres Fertilizer and Manure

**Scenario Description:**

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,570.50

**Scenario Cost/Unit:** $7,570.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 70 | $7,570.50 |

**Practice:** 157 - Nutrient Management Design and Implementation Activity

**Scenario** #22 - Design Nutrient Management for 101 to less than 300 Acres and No Manure

**Scenario Description:**

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,326.00

**Scenario Cost/Unit:** $4,326.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 40 | $4,326.00 |

**Practice:** 157 - Nutrient Management Design and Implementation Activity

**Scenario** #38 - Design Nutrient Management for greater than 300 Acres and No Manure

**Scenario Description:**

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,407.50

**Scenario Cost/Unit:** $5,407.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 50 | $5,407.50 |

**Practice:** 157 - Nutrient Management Design and Implementation Activity

**Scenario** #54 - Design Nutrient Management for less than or equal to 100 Acres Fertilizer and Manure

**Scenario Description:**

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,407.50

**Scenario Cost/Unit:** $5,407.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 50 | $5,407.50 |

**Practice:** 157 - Nutrient Management Design and Implementation Activity

**Scenario** #70 - Design Nutrient Management for less than or equal to 100 Acres and No Manure

**Scenario Description:**

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,244.50

**Scenario Cost/Unit:** $3,244.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 30 | $3,244.50 |

**Practice:** 157 - Nutrient Management Design and Implementation Activity

**Scenario** #86 - Design Nutrient Management for greater than 300 Acres Fertilizer and Manure

**Scenario Description:**

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

**Before Situation:**

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,192.75

**Scenario Cost/Unit:** $9,192.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 85 | $9,192.75 |

**Practice:** 158 - Feed Management Design

**Scenario** #6 - Feed Management Plan

**Scenario Description:**

The owner/operator of an Animal Feeding Operation (AFO) has not received a written Feed Management Plan that addresses all resource concerns present on the facility. Various levels of management and conservation implementation has occurred in the operation. Little documentation of the methods of feed management used and practices installed exists, and the producer is not likely to developed a complete forage inventory or nutrient analysis. The producer may or may not have a conservation plan or a nutrient management plan. Nutrient management related resource concerns on the operation remain to be addressed through the development of a complete activity plan including management and conservation practices for proper quantity and quality of available nutrients, feedstuffs, and/or additives fed to livestock or poultry that may be present on the operation. Present operation and feed methodology poses risk of feeding excessive amounts of nutrients in animal manure which result in negative impacts to water quality and odor resource concerns. Negative water and air quality impacts as well as farmstead safety and security issues may remain on the AFO, and inadequate record-keeping nutrient, inspection and monitoring of the existing operation may need further improvement.

**Before Situation:**

Producer does not have a plan or has limited knowledge of management of feed, nutrients, feedstuffs, or nutritional additives provided to domestic livestock and poultry. The producer currently manages feed without a plan which would address livestock production limitations and water and air quality resource concern impacts. Producer currently lacks plan to provide proper balance of forage, grains or other feeds and supplements to assure domestic animal nutritional needs are met without negatively impacting water and air quality. Producer is interested in management of feed for domestic animals to maximize profit margin, reduce costs, improve or address livestock production opportunities, and for other environmental benefits. Producer is willing to collaborate with a certified Technical Service Provider (TSP) to develop a plan, and to collect/coordinate data and records to determine current nutritional needs. Associated Practice(s): 590-Nutrient Management

**After Situation:**

Participant has obtained services from a certified TSP for development of the Feed Management plan (CAP). The criteria requires the plan to meet quality criteria for applicable natural resource concerns and provides for opportunities to identify and implement conservation practices related to management of feed, forages, or delivery of supplements to maximize efficient feeding operations and livestock growth. The plan may serve as the basis for implementation of the primary conservation practice 592 - Feed Management. If applicable, the plan may also be developed to complement Comprehensive Nutrient Management Plans (CNMP) or to help meet requirements of NRCS practice standard 590 - Nutrient Management. The plan may include recommendations for addressing associated natural resource concerns with other conservation practices.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,326.00

**Scenario Cost/Unit:** $4,326.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 40 | $4,326.00 |

**Practice:** 159 - Grazing Management Design

**Scenario** #102 - Design and Implementation Activities for Grazed Lands <100 acres

**Scenario Description:**

Design and implementation activities for agricultural operation with less than 100 acres grazed land. The following natural resource concerns will be addressed: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resouce concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,636.48

**Scenario Cost/Unit:** $1,636.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 16 | $1,636.48 |

**Practice:** 159 - Grazing Management Design

**Scenario** #118 - Design and Implementation Activities for Grazed Lands 101 to 500 acres

**Scenario Description:**

Design and implementation activities for an agricultural operation with 101 to 500 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resouce concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,045.60

**Scenario Cost/Unit:** $2,045.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 20 | $2,045.60 |

**Practice:** 159 - Grazing Management Design

**Scenario** #134 - Design and Implementation Activities for Grazed Lands 501 to 1,500 acres

**Scenario Description:**

Design and implementation activities for agricultural operation with 501 to 1,500 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,454.72

**Scenario Cost/Unit:** $2,454.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 24 | $2,454.72 |

**Practice:** 159 - Grazing Management Design

**Scenario** #150 - Design and Implementation Activities for Grazed Lands 1,501 to 5,000 acres

**Scenario Description:**

Design and implementation activity for an agricultural operation with 1,501 to 5,000 acres grazed land. The following natural resource concerns will be addressed: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,863.84

**Scenario Cost/Unit:** $2,863.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 28 | $2,863.84 |

**Practice:** 159 - Grazing Management Design

**Scenario** #166 - Design and Implementation Activities for Grazed Lands 5,001 to 10,000 acres

**Scenario Description:**

Design and implementation activities for an agricultural operation with 5,001 to 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resouce concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,272.96

**Scenario Cost/Unit:** $3,272.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 32 | $3,272.96 |

**Practice:** 159 - Grazing Management Design

**Scenario** #182 - Design and Implementation Activities for Grazed Lands >10,000 acres

**Scenario Description:**

Design and implementation activities for an agricultural operation with greater than 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

**Before Situation:**

Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,682.08

**Scenario Cost/Unit:** $3,682.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, range conservation | 1299 | Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price). | Hours | $102.28 | 36 | $3,682.08 |

**Practice:** 160 - Prescribed Burning Design

**Scenario** #6 - Prescribed Burning Plan DIA less than or equal to 20 acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically less than or equal to 20 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,260.00

**Scenario Cost/Unit:** $1,260.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 15 | $1,260.00 |

**Practice:** 160 - Prescribed Burning Design

**Scenario** #22 - Prescribed Burning Plan (DIA) greater than 1,000 acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 1,000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan (DIA). The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,040.00

**Scenario Cost/Unit:** $5,040.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 60 | $5,040.00 |

**Practice:** 160 - Prescribed Burning Design

**Scenario** #38 - Prescribed Burning Plan-DIA greater than 501 acres and less than 1,000 acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 501 acres and less than 1,000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,360.00

**Scenario Cost/Unit:** $3,360.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 40 | $3,360.00 |

**Practice:** 160 - Prescribed Burning Design

**Scenario** #54 - Prescribed Burning Plan -DIA greater than 251 acres and less than 500 acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 251 acres and less than 500 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan or DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,520.00

**Scenario Cost/Unit:** $2,520.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 30 | $2,520.00 |

**Practice:** 160 - Prescribed Burning Design

**Scenario** #70 - Prescribed Burning Plan (DIA) greater than 101 acres and less than 250 acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically greater that 101 acres in size and less than 250 acres and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,100.00

**Scenario Cost/Unit:** $2,100.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 25 | $2,100.00 |

**Practice:** 160 - Prescribed Burning Design

**Scenario** #86 - Prescribed Burning Plan (DIA) greater than 21 acres and less than 100 acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 21 acres and less than 100 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

**Before Situation:**

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan or DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** 1

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,680.00

**Scenario Cost/Unit:** $1,680.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 20 | $1,680.00 |

**Practice:** 161 - Pest Management Conservation System Design

**Scenario** #6 - High Complexity, 5+ CPS

**Scenario Description:**

Agricultural operation where producer will implement high complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 5 or more, high complexity conservation practices and/or PAMS activities.

**Before Situation:**

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities to address resource concerns. High complexity conservation practices may include: prescribed grazing, irrigation water management, diverse conservation plantings and complex practices for such as Agrichemical Handling Facility and Vegetated Treatment Area . High Complexity PAMS activities include: field sanitation , intensive scouting etc.

**After Situation:**

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,325.04

**Scenario Cost/Unit:** $8,325.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 40 | $4,326.00 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 40 | $3,375.20 |
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 8 | $491.76 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |

**Practice:** 161 - Pest Management Conservation System Design

**Scenario** #22 - High Complexity, 1 -4 CPS

**Scenario Description:**

Agricultural operation where producer will implement high complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 1 - 4, high complexity conservation practices and/or PAMS activities.

**Before Situation:**

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities to address resource concerns. High complexity conservation practices may include: prescribed grazing, irrigation water management, diverse conservation plantings and complex practices for such as Agrichemical Handling Facility and Vegetated Treatment Area . High Complexity PAMS activities include: field sanitation , intensive scouting etc.

**After Situation:**

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,751.78

**Scenario Cost/Unit:** $6,751.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 32 | $3,460.80 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 32 | $2,700.16 |
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 8 | $491.76 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |

**Practice:** 161 - Pest Management Conservation System Design

**Scenario** #38 - Low Complexity, 5+ CPS

**Scenario Description:**

Agricultural operation where producer will implement low complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 5 or more, low complexity conservation practices.

**Before Situation:**

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities to address resource concerns. Low complexity conservation practices may include: cover crop, crop rotation, reduced tillage, conservation plantings and minor structural practices for erosion control such as grass waterways and diversions. Low Complexity PAMS activities include: using pest resistant varieties, trap crops, scouting etc.

**After Situation:**

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,752.80

**Scenario Cost/Unit:** $4,752.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 24 | $2,595.60 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 24 | $2,025.12 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |

**Practice:** 161 - Pest Management Conservation System Design

**Scenario** #54 - Low Complexity 1-4 CPS

**Scenario Description:**

Agricultural operation where producer will implement low complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 1 - 4, low complexity conservation practices.

**Before Situation:**

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities to address resource concerns. Low complexity conservation practices may include: cover crop, crop rotation, reduced tillage, conservation plantings and minor structural practices for erosion control such as grass waterways and diversions. Low Complexity PAMS activities include: using pest resistant varieties, trap crops, scouting etc.

**After Situation:**

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,179.54

**Scenario Cost/Unit:** $3,179.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 16 | $1,730.40 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 16 | $1,350.08 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #6 - Organic Crops + Livestock, <5

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for up to 5 Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collaborated with a certified TSP to develop a written Soil Health Management Plan (116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,921.60

**Scenario Cost/Unit:** $6,921.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 64 | $6,921.60 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #22 - Crops, 5 or more

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for more than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,974.90

**Scenario Cost/Unit:** $4,974.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 46 | $4,974.90 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #38 - Crops + Livestock, 5 or more

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,407.50

**Scenario Cost/Unit:** $5,407.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 50 | $5,407.50 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #54 - Small Farm

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for a small farm operation of less than 10 acres.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collaborated with a certified TSP to develop a written Soil Health Management Plan (116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,244.50

**Scenario Cost/Unit:** $3,244.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 30 | $3,244.50 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #70 - Crops, <5

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collaborated with a certified TSP to develop a written Soil Health Management Plan (116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,109.70

**Scenario Cost/Unit:** $4,109.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 38 | $4,109.70 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #86 - Organic Crops, <5

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,758.60

**Scenario Cost/Unit:** $4,758.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 44 | $4,758.60 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #102 - Crops + Livestock, <5

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,326.00

**Scenario Cost/Unit:** $4,326.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 40 | $4,326.00 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #118 - Organic Crops, 5 or more

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,489.00

**Scenario Cost/Unit:** $6,489.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 60 | $6,489.00 |

**Practice:** 162 - Soil Health Management System Design

**Scenario** #134 - Organic Crops + Livestock, 5 or more

**Scenario Description:**

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

**Feature Measure:** each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,652.00

**Scenario Cost/Unit:** $8,652.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 80 | $8,652.00 |

**Practice:** 163 - Irrigation Water Management Design

**Scenario** #6 - 1-2 Designs - Without Pump Test

**Scenario Description:**

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriate resource concerns through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of known performance and less then 3 years old. Each "Design" indicates that new devices or components is closely related to other devices or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client's final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

**Before Situation:**

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Irrigation Water Management DIA. The DIA 163 criteria incorporates recommended measures to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Associated Practices: Code 449-Irrigation Water Management, Code 441-Irrigation System, Microirrigation, Code 442-Sprinkler System, Code 443-Irrigation System, Surface and Subsurface, Code 430-Irrigation Pipeline, Code 428-Irrigation Ditch Lining, Code 388-Irrigation Field Ditch, Code 320-Irrigation Canal or Lateral, Code 587-Structure for Water Control, Code 436-Irrigation Reservoir, Code 447-Irrigation and Drainage Tailwater Recovery, Code 533-Pumping Plant, Code 464-Irrigation Land Leveling, Code 450-Anionic Polyacrylamide (PAM) Application, Code 610-Saline and Sodic Soil Management, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client's decisions and design of conservation practices which address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,841.56

**Scenario Cost/Unit:** $6,841.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, small surveying crew | 1296 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies. | Hours | $121.42 | 8 | $971.36 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 40 | $4,145.60 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 8 | $675.04 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 16 | $983.52 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |

**Practice:** 163 - Irrigation Water Management Design

**Scenario** #22 - 3 or More Designs - Without Pump Test

**Scenario Description:**

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriat resource concerns through an EQIP contract with multiple irrigation practice scenario. The pump for the irrigation system is of known performance and less then 3 years old. Each "Design" indicates that new devices or components is closely related to other decives or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client's final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

**Before Situation:**

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Irrigation Water Management DIA. The DIA 163 criteria incorporates recommended measures to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Associated Practices: Associated Practices: Code 449-Irrigation Water Management, Code 441-Irrigation System, Microirrigation, Code 442-Sprinkler System, Code 443-Irrigation System, Surface and Subsurface, Code 430-Irrigation Pipeline, Code 428-Irrigation Ditch Lining, Code 388-Irrigation Field Ditch, Code 320-Irrigation Canal or Lateral, Code 587-Structure for Water Control, Code 436-Irrigation Reservoir, Code 447-Irrigation and Drainage Tailwater Recovery, Code 533-Pumping Plant, Code 464-Irrigation Land Leveling, Code 450-Anionic Polyacrylamide (PAM) Application, Code 610-Saline and Sodic Soil Management, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,162.74

**Scenario Cost/Unit:** $11,162.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, small surveying crew | 1296 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies. | Hours | $121.42 | 16 | $1,942.72 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 56 | $5,803.84 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 16 | $1,350.08 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 32 | $1,967.04 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |

**Practice:** 163 - Irrigation Water Management Design

**Scenario** #38 - 1-2 Designs - With Pump Test

**Scenario Description:**

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriat resource concerns through an EQIP contract with multiple irrigation practice scenario through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of unknown performance and older than 3 years. Each "Design" indicates that new devices or components is closely related to other devices or components of the irrigation water managment system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client's final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

**Before Situation:**

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. The pump for the irrigation system is of unknown performance and older than 3 years. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Irrigation Water Management DIA. The DIA 163 criteria incorporates recommended measures to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Associated Practices: Code 449-Irrigation Water Management, Code 441-Irrigation System, Microirrigation, Code 442-Sprinkler System, Code 443-Irrigation System, Surface and Subsurface, Code 430-Irrigation Pipeline, Code 428-Irrigation Ditch Lining, Code 388-Irrigation Field Ditch, Code 320-Irrigation Canal or Lateral, Code 587-Structure for Water Control, Code 436-Irrigation Reservoir, Code 447-Irrigation and Drainage Tailwater Recovery, Code 533-Pumping Plant, Code 464-Irrigation Land Leveling, Code 450-Anionic Polyacrylamide (PAM) Application, Code 610-Saline and Sodic Soil Management, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client's decisions and design of conservation practices which address address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 163 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,138.68

**Scenario Cost/Unit:** $8,138.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, small surveying crew | 1296 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies. | Hours | $121.42 | 8 | $971.36 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 48 | $4,974.72 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 8 | $675.04 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 16 | $983.52 |
| CAP Labor, Skilled | 1604 | Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $39.00 | 12 | $468.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |

**Practice:** 163 - Irrigation Water Management Design

**Scenario** #54 - 3 or More Designs - With Pump Test

**Scenario Description:**

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriat resource concerns through an EQIP contract with multiple irrigation practice scenario through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of unknown performance and older than 3 years. Each "Design" indicates that new devices or components is closely related to other devices or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client's final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

**Before Situation:**

Producer wants to improve irrigation water management on their agricultureal operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. The pump for the irrigation system is of unknown performance and older than 3 years. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Irrigation Water Management DIA. The DIA 163 criteria incorporates recommended measures toaddress insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Associated Practices: Code 449-Irrigation Water Management, Code 441-Irrigation System, Microirrigation, Code 442-Sprinkler System, Code 443-Irrigation System, Surface and Subsurface, Code 430-Irrigation Pipeline, Code 428-Irrigation Ditch Lining, Code 388-Irrigation Field Ditch, Code 320-Irrigation Canal or Lateral, Code 587-Structure for Water Control, Code 436-Irrigation Reservoir, Code 447-Irrigation and Drainage Tailwater Recovery, Code 533-Pumping Plant, Code 464-Irrigation Land Leveling, Code 450-Anionic Polyacrylamide (PAM) Application, Code 610-Saline and Sodic Soil Management, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client's decisions and design of conservation practices which address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 163 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,927.86

**Scenario Cost/Unit:** $12,927.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, small surveying crew | 1296 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies. | Hours | $121.42 | 16 | $1,942.72 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 64 | $6,632.96 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 16 | $1,350.08 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 32 | $1,967.04 |
| CAP Labor, Skilled | 1604 | Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $39.00 | 24 | $936.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |

**Practice:** 164 - Improved Management of Drainage Water Design

**Scenario** #6 - 1-2 Designs - Tile Map Available

**Scenario Description:**

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with at least one (1) drainage practice scenario. A map of the tile system is available. Each "Design" indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client's final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

**Before Situation:**

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Drainage Water Management DIA. The DIA 164 criteria incorporates recommended measures to increase water quality, plant condition, or soil health. Associated Practices: 554-Drainage Water Management, 604-Saturated Buffer, 605-Denitrifying Bioreactor, 606-Subsurface Drain, 607-Surface Drain, Field Ditch, 608-Surface Drain, Main or Lateral, 587-Structure for Water Control, 590-Nutrient Management, 340-Cover Crop, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,687.48

**Scenario Cost/Unit:** $6,687.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, small surveying crew | 1296 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies. | Hours | $121.42 | 8 | $971.36 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 32 | $3,316.48 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 16 | $1,350.08 |
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 16 | $983.52 |

| | | | | | | |
|---|---|---|---|---|---|---|
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |

**Practice:** 164 - Improved Management of Drainage Water Design

**Scenario** #22 - 3 or More Designs - Tile Map Available

**Scenario Description:**

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with multiple drainage practice scenario. A map of the tile system is available. Each "Design" indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client's final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

**Before Situation:**

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Drainage Water Management DIA. The DIA 164 criteria incorporates recommended measures to increase water quality, plant condition, or soil health. Associated Practices: 554-Drainage Water Management, 604-Saturated Buffer, 605-Denitrifying Bioreactor, 606-Subsurface Drain, 607-Surface Drain, Field Ditch, 608-Surface Drain, Main or Lateral, 587-Structure for Water Control, 590-Nutrient Management, 340-Cover Crop, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $10,516.90

**Scenario Cost/Unit:** $10,516.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, small surveying crew | 1296 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies. | Hours | $121.42 | 16 | $1,942.72 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 48 | $4,974.72 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 24 | $2,025.12 |
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 24 | $1,475.28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |

**Practice:** 164 - Improved Management of Drainage Water Design

**Scenario** #38 - 1-2 Designs - No Tile Map Available

**Scenario Description:**

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with at least one (1) drainage practice scenario. A map of the tile system is not available. Each "Design" indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client's final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

**Before Situation:**

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Drainage Water Management DIA. The DIA 164 criteria incorporates recommended measures to increase water quality, plant condition, or soil health. Associated Practices: 554-Drainage Water Management, 604-Saturated Buffer, 605-Denitrifying Bioreactor, 606-Subsurface Drain, 607-Surface Drain, Field Ditch, 608-Surface Drain, Main or Lateral, 587-Structure for Water Control, 590-Nutrient Management, 340-Cover Crop, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,111.96

**Scenario Cost/Unit:** $9,111.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, small surveying crew | 1296 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies. | Hours | $121.42 | 16 | $1,942.72 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 40 | $4,145.60 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 16 | $1,350.08 |
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 16 | $983.52 |

| | | | | | | |
|---|---|---|---|---|---|---|
| CAP Labor, Skilled | 1604 | Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $39.00 | 16 | $624.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |

**Practice:** 164 - Improved Management of Drainage Water Design

**Scenario** #54 - 3 or More Designs - No Tile Map Available

**Scenario Description:**

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with multiple drainage practice scenario. A map of the tile system is not available. Each "Design" indicates that new devices or components are closely related to other devices or components of the drainage water management system even if numerous designs are contracted. If more than one practice is contracted, then "2-5 Designs" shall be contracted for the Drainage Water Management DIA. The Drainage Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client's final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

**Before Situation:**

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Drainage Water Management DIA. The DIA 164 criteria incorporates recommended measures to increase water quality, plant condition, or soil health. Associated Practices: 554-Drainage Water Management, 604-Saturated Buffer, 605-Denitrifying Bioreactor, 606-Subsurface Drain, 607-Surface Drain, Field Ditch, 608-Surface Drain, Main or Lateral, 587-Structure for Water Control, 590-Nutrient Management, 340-Cover Crop, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client's decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,452.90

**Scenario Cost/Unit:** $11,452.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, small surveying crew | 1296 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies. | Hours | $121.42 | 16 | $1,942.72 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 48 | $4,974.72 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 24 | $2,025.12 |
| Cap Labor, Survey and Mapping Technician | 1591 | Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. | Hours | $61.47 | 24 | $1,475.28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| CAP Labor, Skilled | 1604 | Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $39.00 | 24 | $936.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |

**Practice:** 165 - Forest Management Practice Design

**Scenario** #6 - DIA Less Than or Equal to 20 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $420.00

**Scenario Cost/Unit:** $420.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 5 | $420.00 |

**Practice:** 165 - Forest Management Practice Design

**Scenario** #22 - DIA 501 to 1000 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,596.00

**Scenario Cost/Unit:** $1,596.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 19 | $1,596.00 |

**Practice:** 165 - Forest Management Practice Design

**Scenario** #38 - DIA 101 to 250 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,008.00

**Scenario Cost/Unit:** $1,008.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 12 | $1,008.00 |

**Practice:** 165 - Forest Management Practice Design

**Scenario** #54 - DIA Greater Than 1000 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,932.00

**Scenario Cost/Unit:** $1,932.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 23 | $1,932.00 |

**Practice:** 165 - Forest Management Practice Design

**Scenario** #70 - DIA 251 to 500 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,344.00

**Scenario Cost/Unit:** $1,344.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 16 | $1,344.00 |

**Practice:** 165 - Forest Management Practice Design

**Scenario** #86 - DIA 21 to 100 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $672.00

**Scenario Cost/Unit:** $672.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 8 | $672.00 |

**Practice:** 199 - Conservation Plan

**Scenario** #22 - Small Farm – less than or equal to 10 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The small farm planning scenario involves combinations of various specialty crops, small fruits, tree and vine crops, and small livestock enterprises on less than or equal to 10 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,260.70

**Scenario Cost/Unit:** $3,260.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 10 | $1,081.50 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 8 | $829.12 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 16 | $1,350.08 |

**Practice:** 199 - Conservation Plan

**Scenario** #38 - Low Complexity Plan, <200 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering up to less than 200 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,134.00

**Scenario Cost/Unit:** $4,134.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 8 | $865.20 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 12 | $1,243.68 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 24 | $2,025.12 |

**Practice:** 199 - Conservation Plan

**Scenario** #54 - Low Complexity Plan, 200-1,000 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering 200-1,000 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,088.80

**Scenario Cost/Unit:** $6,088.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 16 | $1,730.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 32 | $2,700.16 |

**Practice:** 199 - Conservation Plan

**Scenario** #70 - Low Complexity Plan, >1,000 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering more than 1,000 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,113.92

**Scenario Cost/Unit:** $8,113.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 16 | $1,730.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 56 | $4,725.28 |

**Practice:** 199 - Conservation Plan

**Scenario** #86 - Medium Complexity Plan, <200 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering less than 200 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,088.80

**Scenario Cost/Unit:** $6,088.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 16 | $1,730.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 32 | $2,700.16 |

**Practice:** 199 - Conservation Plan

**Scenario** #102 - Medium Complexity Plan, 200-1,000 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering 200-1000 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,113.92

**Scenario Cost/Unit:** $8,113.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 16 | $1,730.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 56 | $4,725.28 |

**Practice:** 199 - Conservation Plan

**Scenario** #118 - Medium Complexity Plan, >1,000 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering more than 1,000 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,887.58

**Scenario Cost/Unit:** $9,887.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 18 | $1,946.70 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 18 | $1,865.52 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 72 | $6,075.36 |

**Practice:** 199 - Conservation Plan

**Scenario** #134 - High Complexity Plan, <200 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use supporting three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on up to less than 200 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,113.92

**Scenario Cost/Unit:** $8,113.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 16 | $1,730.40 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 56 | $4,725.28 |

**Practice:** 199 - Conservation Plan

**Scenario** #150 - High Complexity Plan, 200-1,000 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on 200-1000 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,887.58

**Scenario Cost/Unit:** $9,887.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 18 | $1,946.70 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 18 | $1,865.52 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 72 | $6,075.36 |

**Practice:** 199 - Conservation Plan

**Scenario** #166 - High Complexity Plan, >1,000 acres

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client's preferred alternative(s) (step 7). The Planning Land Unit involves one land use supporting three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on more than 1,000 acres.

**Before Situation:**

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

**After Situation:**

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,409.78

**Scenario Cost/Unit:** $11,409.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 22 | $2,379.30 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 22 | $2,280.08 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 80 | $6,750.40 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #16 - Data Collect Surface Year 1 plus - NO QAPP

**Scenario Description:**

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 to next to the last year of monitoring of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $26,936.44

**Scenario Cost/Unit:** $26,936.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 130 | $6,650.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 60 | $7,936.80 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 4 | $202.44 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 240 | $12,146.40 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #17 - Data Collect Surface Year 1-QAPP

**Scenario Description:**

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

**Feature Measure:** Measuring Sites

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $36,989.72

**Scenario Cost/Unit:** $36,989.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 130 | $6,650.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 136 | $17,990.08 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 4 | $202.44 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 240 | $12,146.40 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #18 - Data Collect Surface Year 1 - NO QAPP

**Scenario Description:**

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for surface sytems. The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $23,907.84

**Scenario Cost/Unit:** $23,907.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 60 | $6,489.00 |
| CAP Labor, Skilled | 1604 | Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $39.00 | 130 | $5,070.00 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 4 | $202.44 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 20 | $1,012.20 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 40 | $2,024.40 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 40 | $2,024.40 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 40 | $2,024.40 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 40 | $2,024.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 40 | $2,024.40 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 20 | $1,012.20 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #20 - Data Collect Surface Last Year

**Scenario Description:**

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected to complete monitoring period.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $32,227.64

**Scenario Cost/Unit:** $32,227.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 130 | $6,650.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 100 | $13,228.00 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 4 | $202.44 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 240 | $12,146.40 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #21 - Data Collect Tile Year 1-QAPP

**Scenario Description:**

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $74,966.92

**Scenario Cost/Unit:** $74,966.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 312 | $15,961.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 166 | $21,958.48 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 12 | $607.32 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 720 | $36,439.20 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #22 - Data Collect Tile Year 1 plus - NO QAPP

**Scenario Description:**

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 to next to the last year of monitoring of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

**Feature Measure:** Measuring Site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $64,913.64

**Scenario Cost/Unit:** $64,913.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 312 | $15,961.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 90 | $11,905.20 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 12 | $607.32 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 720 | $36,439.20 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #24 - Data Collect Tile Last Year

**Scenario Description:**

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $70,204.84

**Scenario Cost/Unit:** $70,204.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 312 | $15,961.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 130 | $17,196.40 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 12 | $607.32 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 720 | $36,439.20 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #25 - Data Collect Surface Year 1-QAPP with two treatment Sites

**Scenario Description:**

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

**Feature Measure:** Measuring Sites

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $50,843.74

**Scenario Cost/Unit:** $50,843.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 156 | $7,980.96 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 184 | $24,339.52 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 6 | $303.66 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 360 | $18,219.60 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #26 - Data Collect Surface Year 1+ less QAPP (pre-install information) with two treatment sites

**Scenario Description:**

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for each surface system, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semi-annual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $38,409.42

**Scenario Cost/Unit:** $38,409.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 156 | $7,980.96 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 90 | $11,905.20 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 6 | $303.66 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 360 | $18,219.60 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #28 - Data Collect Surface Last Year with two treatment sites

**Scenario Description:**

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $46,346.22

**Scenario Cost/Unit:** $46,346.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 156 | $7,980.96 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 150 | $19,842.00 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 6 | $303.66 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 360 | $18,219.60 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #30 - Data Collect Tile Year 1+ less QAPP (pre-install information) with two treatment sites

**Scenario Description:**

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $92,049.82

**Scenario Cost/Unit:** $92,049.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 364 | $18,622.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 135 | $17,857.80 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 18 | $910.98 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 1080 | $54,658.80 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #32 - Data Collect Tile Last Year with two treatment sites

**Scenario Description:**

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

**Before Situation:**

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

**After Situation:**

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

**Feature Measure:** Measuring site

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $99,986.62

**Scenario Cost/Unit:** $99,986.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 364 | $18,622.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 195 | $25,794.60 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $50.61 | 18 | $910.98 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 1080 | $54,658.80 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #13 - System Installation-Surface

**Scenario Description:**

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume.

**Before Situation:**

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $30,371.35

**Scenario Cost/Unit:** $30,371.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Automated sampler with bottles and tubing | 2606 | Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event. | Each | $2,462.76 | 1 | $2,462.76 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,836.48 | 1 | $9,836.48 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 1 | $3,431.00 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,514.32 | 1 | $1,514.32 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,177.50 | 1 | $3,177.50 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 1 | $2,306.00 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #14 - System Installation-Surface Cold Climate

**Scenario Description:**

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume.

**Before Situation:**

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $31,143.25

**Scenario Cost/Unit:** $31,143.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Heater, high efficiency | 1165 | Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only. | 1,000 BTU/Hour | $24.24 | 1 | $24.24 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Automated sampler with bottles and tubing | 2606 | Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event. | Each | $2,462.76 | 1 | $2,462.76 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,836.48 | 1 | $9,836.48 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 1 | $3,431.00 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,514.32 | 1 | $1,514.32 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,177.50 | 1 | $3,177.50 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 1 | $2,306.00 |
| Equipment Shed | 2617 | Equipment shed (10 x 10 foot) made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates. | Each | $747.66 | 1 | $747.66 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #15 - System Installation-Tile

**Scenario Description:**

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, and a berm or other directional flow structure to guide the runoff to a sampling flume.

**Before Situation:**

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $41,625.90

**Scenario Cost/Unit:** $41,625.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 100 | $5,116.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Heater, high efficiency | 1165 | Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only. | 1,000 BTU/Hour | $24.24 | 1 | $24.24 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Automated sampler with bottles and tubing | 2606 | Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event. | Each | $2,462.76 | 2 | $4,925.52 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,836.48 | 1 | $9,836.48 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 2 | $6,862.00 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,514.32 | 2 | $3,028.64 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,177.50 | 1 | $3,177.50 |
| Pre-calibrated flow control structure-subsurface (pipe flow) | 2615 | Equipment used to collect runoff for ease in measure of flow, sample collection and to reduce time in constructing and calibrating of a flow structure. | Each | $895.89 | 1 | $895.89 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 1 | $2,306.00 |
| Equipment Shed | 2617 | Equipment shed (10 x 10 foot) made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates. | Each | $747.66 | 1 | $747.66 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #16 - System Installation-Tile Cold Climate

**Scenario Description:**

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions and a berm or other directional flow structure to guide the runoff to a sampling flume.

**Before Situation:**

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $41,625.90

**Scenario Cost/Unit:** $41,625.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 100 | $5,116.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Heater, high efficiency | 1165 | Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only. | 1,000 BTU/Hour | $24.24 | 1 | $24.24 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Automated sampler with bottles and tubing | 2606 | Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event. | Each | $2,462.76 | 2 | $4,925.52 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,836.48 | 1 | $9,836.48 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 2 | $6,862.00 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,514.32 | 2 | $3,028.64 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,177.50 | 1 | $3,177.50 |
| Pre-calibrated flow control structure-subsurface (pipe flow) | 2615 | Equipment used to collect runoff for ease in measure of flow, sample collection and to reduce time in constructing and calibrating of a flow structure. | Each | $895.89 | 1 | $895.89 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 1 | $2,306.00 |
| Equipment Shed | 2617 | Equipment shed (10 x 10 foot) made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates. | Each | $747.66 | 1 | $747.66 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #17 - System Installation-Above And Below

**Scenario Description:**

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will different on the subsurface flow by allowing a smaller precalibrated flume with the addition of a velocity sensor meter as in the tile alternative.

**Before Situation:**

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $40,214.83

**Scenario Cost/Unit:** $40,214.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 6 | $648.90 |
| CAP Labor, Skilled | 1604 | Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $39.00 | 60 | $2,340.00 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Automated sampler with bottles and tubing | 2606 | Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event. | Each | $2,462.76 | 2 | $4,925.52 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,836.48 | 1 | $9,836.48 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 2 | $6,862.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,514.32 | 2 | $3,028.64 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,177.50 | 2 | $6,355.00 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 1 | $2,306.00 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #18 - System Installation-Above And Below cold climate

**Scenario Description:**

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will different on the subsurface flow by allowing a smaller pre-calibrated flume with the addition of a velocity sensor meter as in the tile alternative.

**Before Situation:**

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $44,939.01

**Scenario Cost/Unit:** $44,939.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Heater, high efficiency | 1165 | Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only. | 1,000 BTU/Hour | $24.24 | 2 | $48.48 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Automated sampler with bottles and tubing | 2606 | Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event. | Each | $2,462.76 | 2 | $4,925.52 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $9,836.48 | 1 | $9,836.48 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 2 | $6,862.00 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $1,514.32 | 2 | $3,028.64 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,177.50 | 2 | $6,355.00 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 2 | $4,612.00 |
| Equipment Shed | 2617 | Equipment shed (10 x 10 foot) made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates. | Each | $747.66 | 2 | $1,495.32 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #19 - System Installation-Retrofit 1

**Scenario Description:**

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and back-up/solar power supply be added to existing system.

**Before Situation:**

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,392.25

**Scenario Cost/Unit:** $5,392.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #20 - System Installation-Retrofit 2

**Scenario Description:**

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, and depth (stage) sensor to be added to existing system.

**Before Situation:**

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,333.89

**Scenario Cost/Unit:** $11,333.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 20 | $1,023.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 1 | $3,431.00 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 1 | $2,306.00 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #21 - System Installation-Retrofit 3

**Scenario Description:**

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, pre-calibrated flow control structure, and depth (stage) sensor to be added to existing system.

**Before Situation:**

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $15,125.31

**Scenario Cost/Unit:** $15,125.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.12 | $95.36 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 1 | $3,431.00 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,177.50 | 1 | $3,177.50 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 1 | $2,306.00 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #22 - System Installation-Retrofit Above and Below 1

**Scenario Description:**

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and two back-up/solar power supply be added to existing paired system.

**Before Situation:**

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,306.17

**Scenario Cost/Unit:** $6,306.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.24 | $190.72 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #136 - System Installation-Retrofit Above 3

**Scenario Description:**

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, two back-up/solar power supplies, two communications devices, two pre-calibrated flumes, and two depth (stage) sensors to be added to existing paired system.

**Before Situation:**

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

**After Situation:**

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

**Feature Measure:** System installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $24,676.73

**Scenario Cost/Unit:** $24,676.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.24 | $190.72 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Depth (stage) sensor | 2608 | Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering | Each | $3,431.00 | 2 | $6,862.00 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,177.50 | 2 | $6,355.00 |
| Device, communications | 2616 | Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only. | Each | $2,306.00 | 2 | $4,612.00 |

**Practice:** 207 - Site Assessment and Soil Testing for Contaminants Activity

**Scenario** #6 - Site Evaluation for Potential Contaminants

**Scenario Description:**

This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown.

**Before Situation:**

Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

**After Situation:**

Site history has been researched and findings indicate a potential for the presence of contaminants. Final report provides the landowner with the level of risk and recommendation for further testing. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

**Feature Measure:** Each Site

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,291.20

**Scenario Cost/Unit:** $5,291.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 40 | $5,291.20 |

**Practice:** 207 - Site Assessment and Soil Testing for Contaminants Activity

**Scenario** #22 - Site Evaluation and Soil Testing for Contaminants

**Scenario Description:**

This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown.

**Before Situation:**

Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

**After Situation:**

Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals, VOCs and PAHs. Final reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

**Feature Measure:** Each Site

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $15,873.60

**Scenario Cost/Unit:** $15,873.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 120 | $15,873.60 |

**Practice:** 207 - Site Assessment and Soil Testing for Contaminants Activity

**Scenario** #38 - Soil Testing and Subsurface Investigation

**Scenario Description:**

This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown. The landowner has a prior Environmental Site Assessment completed by an Environmental Professional. The ESA report recommends further subsurface investigation. OR Landowner has NRCS report from portable Xray Flouresence screening that detected soil contaminants.

**Before Situation:**

Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

**After Situation:**

Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals, VOCs and PAHs. Final reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

**Feature Measure:** Each Site

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $10,582.40

**Scenario Cost/Unit:** $10,582.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 80 | $10,582.40 |

**Practice:** 207 - Site Assessment and Soil Testing for Contaminants Activity

**Scenario** #54 - Soil Testing for Contaminants on Low Risk Sites

**Scenario Description:**

This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown. The landowner has a prior Environmental Site Assessment completed by an Environmental Professional. The ESA report does not require further investigation. OR Landowner has NRCS report from portable Xray Flouresence screening that detected soil contaminants. Screening detection levels are below the State Environmental Protection Agency or equivalent agency published safety thresholds for bare soil residential use.

**Before Situation:**

Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

**After Situation:**

Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals only. Soil test reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

**Feature Measure:** Area of Soil Tested

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $754.64

**Scenario Cost/Unit:** $188.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Test, Soil Test, Heavy Metals | 2735 | Microwave assisted acid digestion of soil for arsenic, cadmium, chromium, copper, lead, molybdenum, nickel, selenium, and zinc using EPA Method 3051A | Number | $108.11 | 4 | $432.44 |

**Practice:** 209 - PFAS Testing in Water or Soil

**Scenario** #6 - PFAS Testing: Simple (Low Complexity) Sampling - Single Sample

**Scenario Description:**

A single sample of water or soil is required to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation. In this scenario, the environmental media being sampled by the qualified individual is of low complexity: there is little temporal or spatial variation to account for in sampling, therefore no pre-sampling planning needed. This could include a single well used for stockwater or irrigation systems. The typical number of tests is 1, assuming that a landowner has a single well or a single field that can be represented by a single composite sample.

**Before Situation:**

Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

**After Situation:**

A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,354.45

**Scenario Cost/Unit:** $1,354.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| PFAS Laboratory Testing in Water and Soils | 2801 | This component supports data collection on PFAS in soil and water. Soil or water samples are to be collected by trained environmental professionals to be analyzed using the appropriate EPA protocol at an accredited laboratory for PFAS. Includes testing and shipping costs. | Number | $560.77 | 1 | $560.77 |

**Practice:** 209 - PFAS Testing in Water or Soil

**Scenario** #22 - PFAS Testing: Simple (Low Complexity) Sampling - Multiple Samples

**Scenario Description:**

Multiple samples of water or soil are needed to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation. In this scenario, the environmental media being sampled by the qualified individual is of low complexity. There is little temporal or spatial variation to account for in sampling, therefore no pre-sampling planning needed. This scenario could apply to small ponds or wells used for stockwater or irrigation systems, a small field, or a small number of fields of uniform soil composition. This scenario assumes that additional time is needed for each collection of multiple samples. The typical number of tests is 5, assuming that a landowner has four fields and a well and each field can be represented by a single composite sample.

**Before Situation:**

Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

**After Situation:**

A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $4,655.77

**Scenario Cost/Unit:** $931.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 14 | $1,851.92 |
| **Materials** | | | | | | |
| PFAS Laboratory Testing in Water and Soils | 2801 | This component supports data collection on PFAS in soil and water. Soil or water samples are to be collected by trained environmental professionals to be analyzed using the appropriate EPA protocol at an accredited laboratory for PFAS. Includes testing and shipping costs. | Number | $560.77 | 5 | $2,803.85 |

**Practice:** 209 - PFAS Testing in Water or Soil

**Scenario** #38 - PFAS Testing: Complicated (High Complexity) Sampling - Multiple Samples

**Scenario Description:**

Multiple samples of water or soil are needed to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation. In this scenario, the environmental media being sampled is of high complexity. There is a need to account for this temporal or spatial variation in sampling. Therefore, additional time is needed to prepare and discuss a comprehensive sampling strategy to detect PFAS and the final comprehensive report with the landowner. This scenario could apply to the agricultural use of multiple sources of water (ponds, wells, and reclaimed water) for stockwater or irrigation systems or to assess multiple fields with variable soil composition. This scenario assumes that additional time is needed for each collection of multiple samples. The typical number of tests is 5, assuming that a farmer has many fields, and the producer doesn't want to test all or has large fields with highly variable soil composition.

**Before Situation:**

Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

**After Situation:**

A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $5,714.01

**Scenario Cost/Unit:** $1,142.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 22 | $2,910.16 |
| **Materials** | | | | | | |
| PFAS Laboratory Testing in Water and Soils | 2801 | This component supports data collection on PFAS in soil and water. Soil or water samples are to be collected by trained environmental professionals to be analyzed using the appropriate EPA protocol at an accredited laboratory for PFAS. Includes testing and shipping costs. | Number | $560.77 | 5 | $2,803.85 |

**Practice:** 216 - Soil Health Testing

**Scenario** #153 - Basic Soil Health Suite + Chemical

**Scenario Description:**

Soil is collected and analyzed in a lab to assess soil health and fertility. A laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to evaluate and/or monitor conservation practices. Laboratory tests must include "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. This scenario also includes a comprehensive chemical soil test (macronutrients + micronutrients). One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). Sample collection is completed by an agricultural service provider, soil scientist, or other agriculture professional and includes time for soil sampling and submission.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

**After Situation:**

A laboratory soil health test and nutrient analysis were completed and the results were interpreted (scored) and explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

**Feature Measure:** polygon

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $213.38

**Scenario Cost/Unit:** $213.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 0.5 | $25.58 |
| **Materials** | | | | | | |
| Test, Soil Test, Comprehensive | 2384 | Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only. | Each | $55.89 | 1 | $55.89 |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |

**Practice:** 216 - Soil Health Testing

**Scenario** #169 - Basic Soil Health Suite

**Scenario Description:**

A soil sample is collected and laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to evaluate and/or monitor conservation practices. Laboratory tests must include "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). This scenario assumes that a comprehensive chemical soil test (macronutrients + micronutrients) has been completed on the same management unit in the last 2 years. Sample collection is completed by an agricultural service provider, soil scientist, or other agriculture professional and includes time for soil sampling and submission.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

**After Situation:**

A laboratory soil health test was completed and the results were interpreted (scored), explained to the producer, and used to establish benchmark conditions for soil health management practices or to evaluate the effectiveness of a conservation practice.

**Feature Measure:** polygon

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $157.49

**Scenario Cost/Unit:** $157.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 0.5 | $25.58 |
| **Materials** | | | | | | |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |

**Practice:** 216 - Soil Health Testing

**Scenario** #185 - Single Indicator

**Scenario Description:**

A laboratory soil health assessment for a single indictor is conducted using recommended methods in technical note 450-03 to evaluate and/or monitor conservation practices. Laboratory tests for the single indicator may include: soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial community structure, enzyme activity or other soil health test. One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). Sample collection is completed by a Qualified Individual and includes time for soil sampling and submission.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

**After Situation:**

A laboratory soil health test of was completed for a single indicator and the results were interpreted (scored) and explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

**Feature Measure:** polygon

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $211.56

**Scenario Cost/Unit:** $211.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 0.5 | $25.58 |
| **Materials** | | | | | | |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |
| Testing, Soil Health Single Indicator | 2795 | Single soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial activity, or microbial diversity according to technical note 450-03 or standard laboratory methods. Includes shipping and handling. | Each | $54.07 | 1 | $54.07 |

**Practice:** 216 - Soil Health Testing

**Scenario** #206 - Soil Health and Dynamic Soil Properties

**Scenario Description:**

A soil sample is collected and laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to evaluate and/or monitor conservation practices. Laboratory tests must include "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon analyzed by a commerical soil testing laboratory. Sampling design meets the requirements of the Dynamic Soil Properties Guide. Soil samples are collected at 0-5, 5-10, and 10-15 cm at a main location and two satellite locations. Sampling locations are on a single soil series/component in similar landscape positions. Sample collection is completed by a Qualified Individual in consultation with NRCS staff as needed. DSP Land Use and Management Questionnaire is completed. This scenario allows for two soil conditions to be sampled for planning purposes.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer is interested in participating in the Dynamic Soil Properties level of sampling design and soil analysis.

**After Situation:**

A laboratory soil health test was completed and the results were interpreted (scored), explained to the producer, and used to establish benchmark conditions for soil health management practices or to evaluate the effectiveness of a conservation practice. Replicated sampling following DSP design provides details of variability within a single Soil Health Management Unit. Management history was reported with the indicator results.

**Feature Measure:** Polygon

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,834.82

**Scenario Cost/Unit:** $2,834.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 9 | $460.44 |
| **Materials** | | | | | | |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 18 | $2,374.38 |

**Practice:** 216 - Soil Health Testing

**Scenario** #222 - Basic Soil Health Suite - No Labor

**Scenario Description:**

A soil sample is collected and laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to evaluate and/or monitor conservation practices. Laboratory tests must include "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). This scenario assumes that a comprehensive chemical soil test (macronutrients + micronutrients) has been completed on the same management unit in the last 2 years. Sample collection is completed with NRCS staff involvement.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

**After Situation:**

A laboratory soil health test was completed and the results were interpreted (scored), explained to the producer, and used to establish benchmark conditions for soil health management practices or to evaluate the effectiveness of a conservation practice.

**Feature Measure:** Polygon

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $131.91

**Scenario Cost/Unit:** $131.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |

**Practice:** 216 - Soil Health Testing

**Scenario** #238 - Basic Soil Health Suite + Comprehensive Chemical - No Labor

**Scenario Description:**

Soil is collected and analyzed in a lab to assess soil health and fertility. A laboratory soil health assessment is conducted using recommended methods in technical note 450-03 to evaluate and/or monitor conservation practices. Laboratory tests must include "basic package" indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). This scenario also includes a comprehensive chemical soil test (macronutrients + micronutrients). Sample collection is completed with NRCS staff involvement.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

**After Situation:**

A laboratory soil health test and nutrient analysis were completed and the results were interpreted (scored) and explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

**Feature Measure:** Polygon

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $187.80

**Scenario Cost/Unit:** $187.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Test, Soil Test, Comprehensive | 2384 | Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only. | Each | $55.89 | 1 | $55.89 |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |

**Practice:** 216 - Soil Health Testing

**Scenario** #254 - Single Indicator - No Labor

**Scenario Description:**

A laboratory soil health assessment for a single indictor is conducted using recommended methods in technical note 450-03 to evaluate and/or monitor conservation practices. Laboratory tests for the single indicator may include: soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial community structure, or enzyme activity. One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). Sample collection is completed with NRCS staff involvement.

**Before Situation:**

Agricultural producer has been farming a system that has not addressed all of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

**After Situation:**

A laboratory soil health test of was completed for a single indicator and the results were interpreted (scored) and explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

**Feature Measure:** Polygon

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $54.07

**Scenario Cost/Unit:** $54.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Testing, Soil Health Single Indicator | 2795 | Single soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial activity, or microbial diversity according to technical note 450-03 or standard laboratory methods. Includes shipping and handling. | Each | $54.07 | 1 | $54.07 |

**Practice:** 217 - Soil and Source Testing for Nutrient Management

**Scenario** #6 - Soil Test Only

**Scenario Description:**

A qualified individual will develop a nutrient testing strategy, collect soil samples and prepare for laboratory analysis; and interpret soil nutrient needs. Typical management unit is 100 acres. Includes Comprehensive Soil Testing to provide both Macro and micro soil nutrient levels.

**Before Situation:**

Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

**After Situation:**

Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,075.82

**Scenario Cost/Unit:** $1,075.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 5 | $77.50 |

**Practice:** 217 - Soil and Source Testing for Nutrient Management

**Scenario** #22 - Soil and Source Material Test

**Scenario Description:**

A qualified individual will develop a nutrient testing strategy, collect soil samples and prepare for laboratory analysis; and interpret soil nutrient needs. Typical whole field soil sampling plus collection of samples for nutrient sources needing to be tested.

**Before Situation:**

Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

**After Situation:**

Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,227.22

**Scenario Cost/Unit:** $4,227.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 25 | $3,307.00 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 20 | $310.00 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 1.3 | $60.11 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 1.3 | $75.04 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 1.3 | $65.79 |

**Practice:** 217 - Soil and Source Testing for Nutrient Management

**Scenario** #38 - Zone or Grid Soil Test

**Scenario Description:**

A qualified individual will develop a nutrient testing strategy, collect soil samples based on a 2.5 acre grid or zone, and prepare for laboratory analysis; and interpret soil nutrient needs. Typical management unit is 100 acres.

**Before Situation:**

Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

**After Situation:**

Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,087.52

**Scenario Cost/Unit:** $2,087.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 40 | $620.00 |

**Practice:** 217 - Soil and Source Testing for Nutrient Management

**Scenario** #54 - Manure or Compost Only

**Scenario Description:**

A qualified individual will develop a nutrient testing strategy, collect manure or compost samples and prepare for laboratory analysis; and interpret crop nutrient needs. Sampling protocol for liquid manure includes agitation per LGU guidelines. Dry manure and compost sampling protocol are performed per LGU guidelines.

**Before Situation:**

Producer does not have manure or compost laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH of the organic source. Nutrients are applied without knowledge of manure or compost nutrient levels.

**After Situation:**

Manure or Compost samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes the amount of nutrients needed for the crop based on manure or compost test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,229.20

**Scenario Cost/Unit:** $1,229.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 4 | $230.88 |

**Practice:** 217 - Soil and Source Testing for Nutrient Management

**Scenario** #70 - Source Water Nutrient Test

**Scenario Description:**

A qualified individual will develop a nutrient testing strategy, collect source water samples and prepare for laboratory analysis; and interpret crop nutrient needs. Typical irrigation water sampling for nutrients, may include drainage water sampling for monitoring nutrient loss or if drainage water is being reused.

**Before Situation:**

Producer does not have Source Water Nutrient laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH of the water source. Nutrients are applied without knowledge of source water nutrient levels.

**After Situation:**

Water samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes the amount of nutrients needed for the crop based on Source Water test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $936.20

**Scenario Cost/Unit:** $936.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 4 | $202.44 |

**Practice:** 217 - Soil and Source Testing for Nutrient Management

**Scenario** #86 - Soil Test- pH Emphasis

**Scenario Description:**

Soil analysis is used as a diagnostic tool to identify fields with soil acidification problems in no-till cropping systems. One soil sample is collected every 40 acres from only the top 3 inches of soil and analyzed for both pH and buffer pH. A recommended three cores should be taken from a 4 sq ft sampling area every 40 acres and composited to provide at least 100 grams of soil for the laboratory test. Test results are georeferenced on a map and can be used to build a lime application budget for the field.

**Before Situation:**

Field shows crop yield decline and areas of lower pH are suspected but not tested. No-till application of nitrogen fertilizers is causing acidification. Soil is sampled to 6-inch depth, multiple sub-samples are collected from random locations in the field and are composited into one main sample, diluting potential low pH results from the top 3-inches of soil. Samples are submitted to the lab to determine pH level in the soil. Fertilizer and liming recommendations are made based on the one composited sample for the whole field.

**After Situation:**

One composited soil sample is collected in a 4 sq ft area from the top 3 inches of soil every 40 acres,. The sample is analyzed for pH and buffer pH. Sample results are georeferenced on a map and and used to identify and diagnose soil acidification problems. Follow up by developing or updating a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590. Producers can then use this diagnostic information to apply lime to raise the soil pH. Topsoil pH and plant productivity and health are both maintained at desirable levels.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $327.16

**Scenario Cost/Unit:** $327.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |

**Practice:** 217 - Soil and Source Testing for Nutrient Management

**Scenario** #102 - Small scale - Soil and Nutrient Source Test

**Scenario Description:**

A qualified individual will develop a nutrient testing strategy, collect soil and nutrient source samples, prepare for laboratory analysis and interpret soil and crop nutrient needs. Typical field size is less than or equal to 0.5 acres (22000 sq ft). Includes Comprehensive Soil Testing to provide both Macro and micro soil nutrient levels.

**Before Situation:**

Producer does not have soil and nutrient source laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for the soil and nutrient source. Nutrients are applied without knowledge of soil and nutrient source test levels.

**After Situation:**

Soil and nutrient source samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes nutrients are needed or not based on soil test results. The amount of nutrients needed is based on Nutrient Source results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $525.36

**Scenario Cost/Unit:** $525.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 0.5 | $23.12 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 0.5 | $28.86 |
| Test, Soil Test, Comprehensive | 2384 | Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only. | Each | $55.89 | 1 | $55.89 |
| Testing, Water Quality | 2613 | Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only. | Each | $50.61 | 1 | $50.61 |

**Practice:** 217 - Soil and Source Testing for Nutrient Management

**Scenario** #118 - Soil Test Only Garden Plots/Raised Beds

**Scenario Description:**

A qualified individual will develop a nutrient testing strategy, collect 5 soil subsamples and combine to one representative sample, prepare for laboratory analysis, and interpret soil nutrient needs. This scenario considers costs for 5 or less raised beds. Cost includes comprehensive soil test based on expected specialty crop production.

**Before Situation:**

Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

**After Situation:**

Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. A Nutrient Management Plan CPS 590 or DIA 157 may be developed after the report is complete.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $646.33

**Scenario Cost/Unit:** $646.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Soil Test, Comprehensive | 2384 | Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only. | Each | $55.89 | 5 | $279.45 |

**Practice:** 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

**Scenario** #6 - Low Complexity

**Scenario Description:**

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. Low complexity would include simple systems of a single enterprise, low number of management units, detailed available history.

**Before Situation:**

The producer's objectives are to improve soil carbon sequestration and greenhouse gas mitigation and to quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and historic management practices are not known.

**After Situation:**

Producer receives a detailed report from COMET-Farm that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,058.24

**Scenario Cost/Unit:** $1,058.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |

**Practice:** 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

**Scenario** #22 - Medium Complexity

**Scenario Description:**

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. Medium complexity would include systems with more than one enterprises, a moderate number of management units, complex or difficult to define history.

**Before Situation:**

The producer objectives are to improve soil carbon sequestration and greenhouse gas mitigation and quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and historic management practices are not known.

**After Situation:**

Producer receives a detailed COMET-Farm report that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,587.36

**Scenario Cost/Unit:** $1,587.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |

**Practice:** 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

**Scenario** #38 - High Complexity

**Scenario Description:**

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. High complexity would include systems with multiple enterprises, high number of management units, and complex or incomplete management history.

**Before Situation:**

The producer objectives are to improve soil carbon sequestration and greenhouse gas mitigation and quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and historic management practices are not known.

**After Situation:**

Producer receives a detailed report from COMET-Farm that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan .

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,116.48

**Scenario Cost/Unit:** $2,116.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 16 | $2,116.48 |

**Practice:** 221 - Soil Organic Carbon Stock Measurement

**Scenario** #6 - Carbon Stock Monitoring

**Scenario Description:**

Soil is collected for organic carbon testing to evaluate and monitor the change in soil carbon stocks before and after the implementation of a conservation practice or conservation plan An area of interest (AOI) of <20 acres is identified in a region that is relatively uniform and is representative of a larger management unit. There are no inclusions or small map units of dissimilar soils, and the topography and vegetation appear uniform. Soil samples are collected by a Qualified Individual (QI) from 4 different depths at 6 different locations within the AOI. Soil bulk density is measured before being analyzed for organic carbon by dry combustion. Payment includes time for soil sampling and sample preparation, submission to the laboratory, and interpretation/delivery of results.

**Before Situation:**

No recent measurements of soil organic carbon stocks have been made in the AOI. Conservation practices are planned or installed for the purpose of improving soil health and sequestering carbon.

**After Situation:**

Soil bulk density was measured before being analyzed for organic carbon by dry combustion. The results were interpreted and explained to the producer. Initial measurements are used to establish benchmark conditions for soil organic carbon stocks. Subsequent measurement are used to evaluate the effectiveness of a conservation practice on carbon sequestration and report the change over time.

**Feature Measure:** Area of Interest Polygon

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,735.37

**Scenario Cost/Unit:** $1,735.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Truck Mounted | 2049 | Truck mounted auger for large diameter excavation. Includes equipment and labor. | Hours | $107.79 | 3 | $323.37 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 48 | $744.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 222 - Indigenous Stewardship Methods Evaluation

**Scenario** #6 - ISME 301 to 1,000 Acres

**Scenario Description:**

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

**Before Situation:**

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for Indigenous people to develop sustainable food systems. A deeper understanding of the planning area's context for Indigenous people is desired and/or greater knowledge about Indigenous Stewardship Methods (ISM) for land stewardship are desired. A Qualified Individual (QI), designated by the governing body of a Tribe or Indigenous culture is available for the program participant to hire (separately from the NRCS program contract)to evaluate the land, gather Indigenous knowledge, and provide results to meet the client's objectives and support the conservation planning process.

**After Situation:**

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $16,640.56

**Scenario Cost/Unit:** $16,640.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 39 | $963.30 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 40 | $742.00 |
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 177 | $14,935.26 |

**Practice:** 222 - Indigenous Stewardship Methods Evaluation

**Scenario** #22 - ISME 1001 to 3,000 Acres

**Scenario Description:**

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

**Before Situation:**

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for Indigenous people to develop sustainable food systems. A deeper understanding of the planning area's context for Indigenous people is desired and/or greater knowledge about Indigenous Stewardship Methods (ISM) for land stewardship are desired. A Qualified Individual (QI), designated by the governing body of a Tribe or Indigenous culture is available for the program participant to hire (separately from the NRCS program contract)to evaluate the land, gather Indigenous knowledge, and provide results to meet the client's objectives and support the conservation planing process.

**After Situation:**

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $22,158.74

**Scenario Cost/Unit:** $22,158.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 39 | $963.30 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 60 | $1,113.00 |
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 238 | $20,082.44 |

**Practice:** 222 - Indigenous Stewardship Methods Evaluation

**Scenario** #38 - ISME Less Than or Equal to 10 Acres

**Scenario Description:**

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

**Before Situation:**

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for Indigenous people to develop sustainable food systems. A deeper understanding of the planning area's context for Indigenous people is desired and/or greater knowledge about Indigenous Stewardship Methods (ISM) for land stewardship are desired. A Qualified Individual (QI), designated by the governing body of a Tribe or Indigenous culture is available for the program participant to hire (separately from the NRCS program contract)to evaluate the land, gather Indigenous knowledge, and provide results to meet the client's objectives and support the conservation planing process.

**After Situation:**

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,701.14

**Scenario Cost/Unit:** $6,701.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 39 | $963.30 |
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 68 | $5,737.84 |

**Practice:** 222 - Indigenous Stewardship Methods Evaluation

**Scenario** #54 - ISME 11 to 300 Acres

**Scenario Description:**

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

**Before Situation:**

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for Indigenous people to develop sustainable food systems. A deeper understanding of the planning area's context for Indigenous people is desired and/or greater knowledge about Indigenous Stewardship Methods (ISM) for land stewardship are desired. A Qualified Individual (QI), designated by the governing body of a Tribe or Indigenous culture is available for the program participant to hire (separately from the NRCS program contract)to evaluate the land, gather Indigenous knowledge, and provide results to meet the client's objectives and support the conservation planing process.

**After Situation:**

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,948.86

**Scenario Cost/Unit:** $8,948.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 39 | $963.30 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| **Labor** | | | | | | |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 92 | $7,762.96 |

**Practice:** 223 - Forest Management Assessment

**Scenario** #6 - CEMA less than or equal to 20 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop and implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $840.00

**Scenario Cost/Unit:** $840.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 10 | $840.00 |

**Practice:** 223 - Forest Management Assessment

**Scenario** #22 - CEMA 21 to 100 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop and implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,596.00

**Scenario Cost/Unit:** $1,596.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 19 | $1,596.00 |

**Practice:** 223 - Forest Management Assessment

**Scenario** #38 - CEMA 101 to 250 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop and implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,024.00

**Scenario Cost/Unit:** $3,024.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 36 | $3,024.00 |

**Practice:** 223 - Forest Management Assessment

**Scenario** #54 - CEMA 251 to 500 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop and implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,536.00

**Scenario Cost/Unit:** $4,536.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 54 | $4,536.00 |

**Practice:** 223 - Forest Management Assessment

**Scenario** #70 - CEMA 501 to 1000 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,712.00

**Scenario Cost/Unit:** $5,712.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 68 | $5,712.00 |

**Practice:** 223 - Forest Management Assessment

**Scenario** #86 - CEMA Greater Than 1000 acres

**Scenario Description:**

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

**Before Situation:**

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

**After Situation:**

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,644.00

**Scenario Cost/Unit:** $7,644.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 91 | $7,644.00 |

**Practice:** 224 - Aquifer Flow Test

**Scenario** #7 - Aquifer Flow Test

**Scenario Description:**

The typical scenario supports the utilization of an existing or planned vertical turbine or submersible pump in an existing or planned water well for pressurizing an irrigation or stockwater system where water well flow rate is unknown. An aquifer flow test (e.g., step drawdown or constant rate) will be done to determine the flow rate from the well and select a pumping plant to match the pumping requirements of the irrigation or livestock system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water for livestock - Inefficient use of irrigation water; inefficient energy use. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Micro-irrigation; 449 - Irrigation Water Management, 642 - Water Well, 516 - Livestock Pipeline

**Before Situation:**

Livestock or irrigation system is delivering insufficient water due to unknown volume and flow rate of the aquifer.

**After Situation:**

With the completion of the aquifer flow test, a known flow rate of the well will determine the correct flow rate and TDH on which a pump can be selected to support an irrigation of stockwater system.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,825.79

**Scenario Cost/Unit:** $1,825.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Aquifer Flow Test | 1817 | High-volume aquifer flow test. Includes labor and equipment. | Hours | $196.79 | 8 | $1,574.32 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #6 - Large size, 3 Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,281.22

**Scenario Cost/Unit:** $8,281.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 34 | $3,523.76 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 24 | $1,212.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 48 | $3,446.40 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #22 - Large size, 4+ Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,919.76

**Scenario Cost/Unit:** $9,919.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 42 | $4,352.88 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 28 | $1,414.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 56 | $4,020.80 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #38 - Large size, 2 Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,642.68

**Scenario Cost/Unit:** $6,642.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 26 | $2,694.64 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 20 | $1,010.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 40 | $2,872.00 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #54 - Medium size, 4+ Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,723.52

**Scenario Cost/Unit:** $8,723.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 36 | $3,731.04 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 28 | $1,414.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 48 | $3,446.40 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #70 - Small size, 4+ Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,734.56

**Scenario Cost/Unit:** $7,734.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 32 | $3,316.48 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 28 | $1,414.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 4 | $132.08 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 40 | $2,872.00 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #86 - Medium size, 3 Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,084.98

**Scenario Cost/Unit:** $7,084.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 28 | $2,901.92 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 24 | $1,212.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 40 | $2,872.00 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #102 - Small size, 3 Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,096.02

**Scenario Cost/Unit:** $6,096.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 24 | $2,487.36 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 24 | $1,212.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 3 | $99.06 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 32 | $2,297.60 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #118 - Medium size, 2 Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,446.44

**Scenario Cost/Unit:** $5,446.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 20 | $2,072.80 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 20 | $1,010.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 32 | $2,297.60 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #134 - Small size, 2 Enterprises

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,457.48

**Scenario Cost/Unit:** $4,457.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 20 | $1,010.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 2 | $66.04 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 24 | $1,723.20 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #150 - Large size, 1 Enterprise

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A large operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,004.14

**Scenario Cost/Unit:** $5,004.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 18 | $1,865.52 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 16 | $808.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 1 | $33.02 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 32 | $2,297.60 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #166 - Medium size, 1 Enterprise

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A medium operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,807.90

**Scenario Cost/Unit:** $3,807.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 12 | $1,243.68 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 16 | $808.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 1 | $33.02 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 24 | $1,723.20 |

**Practice:** 228 - Agricultural Energy Assessment

**Scenario** #182 - Small size, 1 Enterprise

**Scenario Description:**

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A small operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

**Before Situation:**

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

**After Situation:**

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,818.94

**Scenario Cost/Unit:** $2,818.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 8 | $829.12 |
| CAP Labor, Manager | 1603 | Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $50.50 | 16 | $808.00 |
| CAP Labor, Administrative Assistant | 1739 | Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers. | Hours | $33.02 | 1 | $33.02 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hours | $71.80 | 16 | $1,148.80 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #1 - Agrichemical Storage Mixing & Handling Pad in New building, steep site

**Scenario Description:**

This practice scenario is an agrichemical handling facility for storage and mixing and loading operations. Steep site topography mandates that storage and handling area be 2' higher than loading and mixing pad. Include a secured area for chemical storage of 16'x20'. Building is enclosed except for opening to entrance and exit the mixing pad and keeps wind blown rain out. Ventilation not an issue as liquid chemcials used, no powder. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

**Before Situation:**

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

An agrichemical storage and handling facility is constructed inside an enclosed building. This is a common practice. An agrichemical handling facility for storage and mixing and loading is constructed to a 35' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs. The storage area for rinsate tanks (16' x20') and locked chemical storage (16' x20') is elevated by 2' over the loading pad. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Total Containment Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,400.00

**Scenario Total Cost:** $70,812.10

**Scenario Cost/Unit:** $50.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 25 | $10,295.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 10 | $5,403.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 350 | $1,473.50 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 24 | $1,763.76 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 19 | $612.18 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 32 | $1,593.92 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 22 | $667.92 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 2 | $62.30 |
| Post Frame Building, enclosed 4 sides | 1046 | Enclosed post frame building, four walls. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, and labor only. | Square Feet | $23.09 | 1400 | $32,326.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| Cement, Type I or II | 1336 | Type I or II Portland Cement (94 lb. bag), Materials only. | Each | $17.62 | 27 | $475.74 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 1400 | $1,540.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $821.00 | 1 | $821.00 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 1946 | $1,517.88 |
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallons | $2.66 | 600 | $1,596.00 |
| Wall, Interior | 2304 | Interior partition wall, 10 ft. high, 2 x 4 studs on 16 inch center, 3/4 inch plywood sheathing. Includes materials, equipment and labor. | Feet | $132.69 | 36 | $4,776.84 |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4 x 7 ft. Materials only. | Each | $1,796.37 | 1 | $1,796.37 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #2 - Convert existing building to a storage, handling, and mixing pad

**Scenario Description:**

This practice scenario is an agrichemical handling facility for storage and mixing and loading operation in an existing buliding. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

**Before Situation:**

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

An agrichemical storage and handling facility is constructed inside an existing enclosed building. A agrichemical handling facility for storage and mixing and loading is installed with dimensions of 35' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. Entire area used is on one elevation. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs. Add 3 walls for secure area that is 16' x20'. One side is ex istnig. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Total Containment Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,400.00

**Scenario Total Cost:** $27,304.60

**Scenario Cost/Unit:** $19.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 25 | $10,295.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 6 | $3,241.80 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 14 | $425.04 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 1400 | $1,540.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $821.00 | 1 | $821.00 |
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallons | $2.66 | 600 | $1,596.00 |
| Wall, Interior | 2304 | Interior partition wall, 10 ft. high, 2 x 4 studs on 16 inch center, 3/4 inch plywood sheathing. Includes materials, equipment and labor. | Feet | $132.69 | 36 | $4,776.84 |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4 x 7 ft. Materials only. | Each | $1,796.37 | 1 | $1,796.37 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #3 - Earthen Liquid Agrichemical Storage with a Handling Pad

**Scenario Description:**

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals along with a mixing and loading pad. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A)

**Before Situation:**

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with a handling pad for mixing and loading operations. The average size of the agrichemical handling facility for proper storage of liquid agrichemicals is in an earthen lined containment with bottom dimensions of 30 ft x 40 ft. A handling pad for mixing and loading is located next to the liquid containment and is 20' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Floor surface area of Liquid Contai

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $12,249.86

**Scenario Cost/Unit:** $6.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 15 | $6,177.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2 | $1,080.60 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 235 | $601.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 235 | $989.35 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 13 | $394.68 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 9 | $280.35 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 800 | $880.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 4 | $277.76 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #4 - Fabricated Liquid Agrichemical Storage with a Handling Pad

**Scenario Description:**

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals along with a mixing and loading pad. Due to topography, limited site space and/or geological conditions a fabricated, lined structure is needed for liquid storage area. No roof. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A)

**Before Situation:**

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with a handling pad for mixing and loading operations. The average size of the agrichemical handling facility for proper storage of liquid agrichemicals is in fabricated containment that is 30 ft x 40 ft with flexible membrane lined walls. The walls are of modular blocks stacked two for a 4ft wall height on four sides. A handling pad for mixing and loading is located next to the liquid containment and is 16' x 32' with an application equipment length of 24 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Liquid Containment Area + Handlin

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,712.00

**Scenario Total Cost:** $39,564.77

**Scenario Cost/Unit:** $23.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 19 | $7,824.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 8 | $4,322.40 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 2024 | $2,874.08 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2 | $8.42 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 6 | $440.94 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 27 | $819.72 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 4 | $124.60 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 2024 | $14,754.96 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yards | $121.17 | 42 | $5,089.14 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 512 | $563.20 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #5 - Outdoor Liquid Storage, Roofed Building and Pad

**Scenario Description:**

This practice scenario is an agrichemical handling facility for storage of liquid agrichemicals along with a roofed mixing and loading pad that is also sized to store dry chemicals. Site soils are suitable for making a liquid tight, temporary containment. This practice addresses water quality degradation due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Pond Sealing or Lining Flexible Membrane (521A), Roof Runoff Management (558)

**Before Situation:**

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with a roofed building to store dry agrichemicals with a handling pad for mixing and loading operations. The average size of the agrichemical handling facility for proper storage of liquid agrichemicals is in an earthen lined containment with bottom dimensions of 60 ft x 40 ft. A roofed building for dry agrichemicals and handling pad for mixing and loading is located next to the liquid containment and is 30' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is roofed and sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump, facility contaiment has at least two sides construced of 5 ft post and plank walls. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Floor surface area of Liquid Contai

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $59,693.49

**Scenario Cost/Unit:** $16.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1.5 | $617.70 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 23 | $12,426.90 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 380 | $972.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 380 | $1,599.80 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 19 | $576.84 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 36 | $1,121.40 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 853 | $2,038.67 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 1200 | $1,320.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Roof, Post Frame Building, 30 to 60 ft. wide | 1676 | Post Frame Building, no sides, - 30 to 60 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation. | Square Feet | $16.19 | 2000 | $32,380.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 4 | $277.76 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #6 - Agrichemical Handling Pad for mixing and loading only

**Scenario Description:**

This practice scenario is an agrichemical handling facility for mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

**Before Situation:**

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

This scenario is an agrichemical handling facility pad for mixing and loading operations. The average size of the agrichemical handling pad for mixing and loading is 16' x 40' with an application equipment length of 32 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump, containment of the pad is surrounded by sloped and ramped reinforced concrete. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Total Containment Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 640.00

**Scenario Total Cost:** $13,755.17

**Scenario Cost/Unit:** $21.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 15 | $6,177.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 12 | $881.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 10 | $303.60 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 640 | $704.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $821.00 | 1 | $821.00 |
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallons | $2.66 | 300 | $798.00 |
| Pump, Sump, less than 1/4 HP | 2582 | Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft. or more, 300 GPH at 10 ft., electric, manually operated. Includes materials and shipping (pump and motor). | Each | $168.16 | 1 | $168.16 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #7 - Agrichemical Storage & Handling, portable pads in existing Bldg

**Scenario Description:**

This practice scenario is an agrichemical storage and handling facility for mixing and loading operations within an existing structure. Floor containment is not suitable for containment, must use portable structures for spill or leak collection. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

**Before Situation:**

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

This scenario is an agrichemical handling facility storage an impermeable barrier poly pad for mixing and loading operations. The average size of the agrichemical handling storage is for a pallet drum on a 5 ft x 5 ft contaiment pallet with sump capacity included. A poly pad is used for mixing and loading that is 8ft x 8ft with an application equipment length of 4 ft. The portable handling pad is used for mixing and loading operations with small hand held sprayers. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Storage Containment Area + Handli

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 89.00

**Scenario Total Cost:** $1,963.43

**Scenario Cost/Unit:** $22.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| 2 Drum Spill Pallet, 66 Gallon | 1610 | Pre fabricated containment basin with a capacity of approximately 66 gal. Materials only. | Each | $319.43 | 1 | $319.43 |
| PVC Containment Basin, 6' x 6' | 1611 | Poly containment basin typically 8 to12 inches deep with area dimensions in the range of 6' x 6' or larger. | Square Feet | $21.66 | 64 | $1,386.24 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #8 - Agrichemical Handling Pad with roof for mixing and loading no storage

**Scenario Description:**

This practice scenario is an agrichemical handling facility for mixing and loading operations. Scenario does not include storage. This practice addresses water quality degradation and due to mis-handling, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

**Before Situation:**

Operator has secure storage for agrichemicals but lacks a suitable area for mixing and loading. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

This scenario is an agrichemical handling facility pad for mixing and loading operations. The average size of the agrichemical handling pad for mixing and loading is 16' x 40' with an application equipment length of 32 ft. Roof width extends 4' out of each side for an area of 24'x 40. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with a wood and truss roof but no walls. The concrete is sealed and sloped to a collection sump, containment of the pad is surrounded by sloped and ramped reinforced concrete. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Area of pad

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 640.00

**Scenario Total Cost:** $29,297.57

**Scenario Cost/Unit:** $45.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 15 | $6,177.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 12 | $881.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 10 | $303.60 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 640 | $704.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $821.00 | 1 | $821.00 |
| Roof, Post Frame Building, 30 to 60 ft. wide | 1676 | Post Frame Building, no sides, - 30 to 60 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation. | Square Feet | $16.19 | 960 | $15,542.40 |
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallons | $2.66 | 300 | $798.00 |
| Pump, Sump, less than 1/4 HP | 2582 | Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft. or more, 300 GPH at 10 ft., electric, manually operated. Includes materials and shipping (pump and motor). | Each | $168.16 | 1 | $168.16 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #9 - Agrichemical Storage & Handling Pad in New building

**Scenario Description:**

This practice scenario is an agrichemical handling facility for storage and mixing and loading operations. Layout of facility on level site. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595)

**Before Situation:**

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

**After Situation:**

An agrichemical storage and handling facility is constructed inside a new building. A agrichemical handling facility for storage and mixing and loading is installed with dimensions of 35' x 40' with an application equipment length of 32 ft x 16' wide. Remaining area used for rinsate tank storage with a 14' x 20' area walled to secure chemicals. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. Entire area used is on one elevation. The concrete is sealed and sloped to a collection sump, facility containment is surrounded by square and ramped curbs. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Total Pad Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,400.00

**Scenario Total Cost:** $56,733.92

**Scenario Cost/Unit:** $40.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 25 | $10,295.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 12 | $881.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 19 | $612.18 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 14 | $425.04 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| Cement, Type I or II | 1336 | Type I or II Portland Cement (94 lb. bag), Materials only. | Each | $17.62 | 27 | $475.74 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 1400 | $1,540.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $821.00 | 1 | $821.00 |
| Roof, Post Frame Building, 30 to 60 ft. wide | 1676 | Post Frame Building, no sides, - 30 to 60 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation. | Square Feet | $16.19 | 1400 | $22,666.00 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 1946 | $1,517.88 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tank, rinsate or chemical storage, > 100 to 300 gal | 2050 | Poly tank reservoir for storing rinsate or other liquid agrichemicals. Greater than 100 to 300 gallon capacity. Materials only. | Gallons | $2.66 | 600 | $1,596.00 |
| Wall, Interior | 2304 | Interior partition wall, 10 ft. high, 2 x 4 studs on 16 inch center, 3/4 inch plywood sheathing. Includes materials, equipment and labor. | Feet | $132.69 | 34 | $4,511.46 |
| Wall, Exterior, Metal | 2305 | Exterior wall, 2 x 4 studs on 24 inch center, 30 gauge galvanized steel sheeting, and one pre-hung door. Includes materials, equipment and labor. | Feet | $162.52 | 34 | $5,525.68 |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4 x 7 ft. Materials only. | Each | $1,796.37 | 1 | $1,796.37 |
| Pump, Sump, less than 1/4 HP | 2582 | Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft. or more, 300 GPH at 10 ft., electric, manually operated. Includes materials and shipping (pump and motor). | Each | $168.16 | 1 | $168.16 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 309 - Agrichemical Handling Facility

**Scenario** #10 - Dry, Bulk Storage in Roofed Concrete Bins

**Scenario Description:**

This practice scenario is an agrichemical handling facility for storage of bulk, dry agrichemicals. The storage area consists of two bins. The facility is roofed and enclosed by three wall. The open side of the bins is secured by overhead doors. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Nutrient Management (590), Pest Management (595),

**Before Situation:**

Dry, bulk agrichemicals are dumped directly on the ground and temporarily stored in a stockpile at the edge of the field. The Operator loads the agrichemicals and fills the spreader equipment over the spring planting season. The stockpile is subject to foul weather conditions. Rainfall falling on the stockpile can runoff to a nearby surface water. Leachate from the stockpile can contaminate the soil and groundwater.

**After Situation:**

This scenario is an agrichemical handling facility for the storage of dry, bulk agrichemicals in an enclosed facility. The typical size of the storage facility is 24' x 30', made up of two bays 12' x 30'. The storage bays consist of a concrete pad with concrete retaining walls on three sides. The walls are 8 ft high and 8" thick with spread footings. The interior concrete slab is 6" thick; whereas the footings are 12" thick. The roof structure is of post and beam timber construction with the posts set on top of the concrete walls. The eave height is up to 20 feet to accomodate equipment. Wall sheathing extends from the top of the concrete wall to the roof structure. One side is open for access where a rolled curb and two overhead doors prevent rainwater from entering the storage area. A working pad is required in front of the facility to permit loading and unloading, but is to be included under Heavy Use Area Protection.

**Feature Measure:** Total Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 720.00

**Scenario Total Cost:** $53,174.95

**Scenario Cost/Unit:** $73.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 9 | $3,706.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 40 | $21,612.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 48 | $202.08 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 12 | $881.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 26 | $809.90 |
| Post Frame Building, enclosed 4 sides | 1046 | Enclosed post frame building, four walls. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, and labor only. | Square Feet | $23.09 | 720 | $16,624.80 |
| Cement, Type I or II | 1336 | Type I or II Portland Cement (94 lb. bag), Materials only. | Each | $17.62 | 16 | $281.92 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 1872 | $2,059.20 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 1001 | $780.78 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Fan, exhaust, 18 in. High Efficiency | 2356 | 18 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials and shipping only. Exhaust fan, controls, wiring and associated appurtenances (excludes installation) Ventilation - Exhaust Replacement of a conventional exhaust fan with high volume, low speed, efficient exhaust fan. Fans being installed should be models previously tested by BESS lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. | Each | $862.31 | 1 | $862.31 |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4 x 7 ft. Materials only. | Each | $1,796.37 | 2 | $3,592.74 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 311 - Alley Cropping

**Scenario** #1 - Alley Cropping, single row

**Scenario Description:**

The crop or grass land is planted with rows of trees to increase crop diversity. Final row width, and spacing of trees within the row, is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. The resource concerns are plant condition - inadequate structure and composition.

**Before Situation:**

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

**After Situation:**

Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing.

**Feature Measure:** planted seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 900.00

**Scenario Total Cost:** $34,554.60

**Scenario Cost/Unit:** $38.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 80 | $768.80 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 90 | $5,699.70 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1.25 | $445.09 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 1.25 | $382.81 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 180 | $5,799.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 80 | $2,721.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 900 | $11,169.00 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 900 | $4,140.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.07 | 900 | $63.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 900 | $2,196.00 |

**Practice:** 311 - Alley Cropping

**Scenario** #2 - 3 row alley cropping

**Scenario Description:**

Cropland is planted with trees in 3-row sets with 40 foot alleyways in between. The outside rows of trees are conifers and the center row a mast-producing high-value hardwood timber species. Between row spacing is 16 feet and between tree spacing is 10 feet. The resource concerns are Plant Condition - inadequate structure and composition; Soil Erosion (wind); Excess/ Insufficient Water (inefficient moisture management); Inadequate Habitat for Fish and Wildlife (food, cover/shelter, continuity).

**Before Situation:**

The landscape has been cropped for many years. It is void of any perennial tree vegetation. Wind erosion is evident, insufficient water for crops occurs due to excessive winds, wildlife habitat score is very low due to the lackof any perennial vegetation. Site preparation needs may include deep ripping to eliminate any plow pan prior to tree planting.

**After Situation:**

Trees have been established to diversify the crop production, reduce erosion by wind and water and improve growing conditions for crops in alleyways. Typically the area planted is 10 acres.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $9,381.47

**Scenario Cost/Unit:** $938.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 2.5 | $14.65 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 2.5 | $890.18 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 2.5 | $765.63 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2.5 | $85.05 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 605 | $496.10 |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.66 | 1210 | $798.60 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 605 | $2,783.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.07 | 605 | $42.35 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 605 | $1,476.20 |

**Practice:** 311 - Alley Cropping

**Scenario** #260 - Alley Cropping Single Row - Small Acreage

**Scenario Description:**

The crop or grass land is planted with rows of trees to increase crop diversity. Final row width, and spacing of trees within the row, is based site size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. The resource concerns are plant condition - inadequate structure and composition.

**Before Situation:**

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On grassland competing vegetation control is accomplished prior to tree planting.

**After Situation:**

Trees have been established to diversify crop production of the field. Typically the area planted is less than 5 acres on approximately 12 x 40 foot spacing.

**Feature Measure:** Planted Seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 450.00

**Scenario Total Cost:** $12,777.25

**Scenario Cost/Unit:** $28.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 75 | $960.75 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 75 | $2,416.50 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 450 | $5,584.50 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 450 | $2,070.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.07 | 900 | $63.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 450 | $1,098.00 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #1 - Earthen Storage Facility < 50K cuft Storage

**Scenario Description:**

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Subsurface Drain(606), Underground Outlet (620), Structure for Water Control (587),Roofs and Covers (367), and Solid/Liquid Waste Separation Facility (632), Waste Treatment (629) .

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Payment made on struck full volume which include freeboard. Typical design size : design storage volume 32,466 ft3; 87'X87' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 9.5' (design depth = 7.5'); (not inclued in volume - 1' freeboard , 0.5' net rainfall and 0.5' sludge accumulation). Struck full volume = 35,058 cf

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 35,058.00

**Scenario Total Cost:** $15,840.50

**Scenario Cost/Unit:** $0.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1070 | $4,504.70 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 1070 | $3,884.10 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 348 | $316.68 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 722 | $2,779.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 32 | $1,712.32 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #2 - Earthen Storage Facility 50K to 200k cuft Storage

**Scenario Description:**

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a struck full storage volume between 50,000 ft3 -200,000 ft3 This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Subsurface Drain(606), Underground Outlet (620), Structure for Water Control (587),Roofs and Covers (367), and Solid/Liquid Waste Separation Facility (632), Waste Treatment (629) .

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 78,510 ft3; 130'x130' (top); 2.5:1 inside and 3:1 outside side slopes; cut/fill ratio = 1.25; total depth = 12' (design depth = 9'); (not inclued in design volume - 2' freeboard , 0.5' net rainfall and 0.5' sludge accumulation). Struck full volume = 123,600 cf

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 123,600.00

**Scenario Total Cost:** $41,507.88

**Scenario Cost/Unit:** $0.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2080 | $8,756.80 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 2080 | $7,550.40 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 60 | $6,056.40 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 60 | $5,670.60 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1480 | $1,346.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 120 | $5,977.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #3 - Earthen Storage Facility >200K cuft Storage

**Scenario Description:**

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of more than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Subsurface Drain(606), Underground Outlet (620), Structure for Water Control (587),Roofs and Covers (367), and Solid/Liquid Waste Separation Facility (632), Waste Treatment (629) .

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 210,810 ft3; 175'x175' (top); 2.5:1 inside and 3:1 outside side slopes; cut/fill ratio = 1.25; total depth = 12' (design depth = 9'); (not inclued in design volume - 2' freeboard , 0.5' net rainfall and 0.5' sludge accumulation). Struck full volume = 255,900 cf

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 255,900.00

**Scenario Total Cost:** $65,984.72

**Scenario Cost/Unit:** $0.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 3960 | $16,671.60 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 5500 | $19,965.00 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1900 | $1,729.00 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 4500 | $17,325.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 80 | $4,280.80 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 4 | $1,920.52 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #4 - Earthen Storage Facility High Water Table

**Scenario Description:**

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. Due to high watertable conditions, the earthen embankment is constructed on the soil surface. Earthfill is obtained within five miles off-site. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size: design storage volume 121,200 ft3; 150'X150' (top); 3:1 inside and outside side slopes; embankment topwidth = 10'; compaction ratio = 1.1; total depth = 10' (design depth = 8.5'); (not inclued in volume - 1' freeboard and 0.5' sludge accumulation); embankment volume = 4*160*((10+70)/2)*10*1.1 Struck Full Volume = 146,970 CF

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 146,970.00

**Scenario Total Cost:** $157,187.34

**Scenario Cost/Unit:** $1.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 10430 | $43,910.30 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 10430 | $37,860.90 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 75 | $9,978.75 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 741 | $674.31 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 9689 | $37,302.65 |
| Hauling, bulk, highway truck | 1615 | Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck. | Cubic Yard Mile | $0.38 | 48445 | $18,409.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 75 | $3,735.75 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 32 | $1,712.32 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #5 - Tank, Above Ground < 25K cuft storage

**Scenario Description:**

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 25,000 ft3. Payment made on struck full volume. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Solid/Liquid Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : Storage Volume struck full (Includes freeboard),14,333; based on 31' X 19' glass lined steel tank

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 14,333.00

**Scenario Total Cost:** $136,384.68

**Scenario Cost/Unit:** $9.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 12 | $4,941.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 16 | $8,644.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 80 | $336.80 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 80 | $308.00 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 15 | $467.25 |
| Waste Storage, Glass lined steel structure (<25,000 ft3) | 1616 | Includes materials, equipment and labor to install 31' (diameter) X19' (height) steel lined structure. Includes materials, equipment and labor. | Cubic Feet | $8.45 | 14333 | $121,113.85 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #6 - Tank, Above Ground 25K up to 100K cuft storage

**Scenario Description:**

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of between 25,000 and 100,000 ft3. Payment made on struck full volume. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Solid/Liquid Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 71,160 ft3 plus 6" for freeboard on 70' X 19' glass lined steel tank. Struck full= 73,084 ft3

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 73,084.00

**Scenario Total Cost:** $295,982.87

**Scenario Cost/Unit:** $4.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 63 | $25,943.40 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 36 | $19,450.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 240 | $1,010.40 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 320 | $1,232.00 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 71 | $2,211.65 |
| Waste Storage, glass lined steel structure, 25,000 - 100,000 cubic foot | 1620 | Includes materials, equipment and labor to install a steel glass lined structure (based on typical 73' diameter X 19' height) . Includes materials, equipment and labor. | Cubic Feet | $3.36 | 73084 | $245,562.24 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #7 - Tank, Above Ground >100K up to 200K cuft storage

**Scenario Description:**

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of between 100,000 and 200,000 ft3. Payment is based on struck full volume. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Solid/Liquid Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume 182,172 ft3 plus 0.5' freeboard; based on 112' X 19' glass lined steel tank: struck full volume = 187,094 ft3

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 187,094.00

**Scenario Total Cost:** $577,315.86

**Scenario Cost/Unit:** $3.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 152 | $62,593.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 59 | $31,877.70 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 550 | $2,315.50 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 730 | $2,810.50 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 182 | $5,669.30 |
| Waste Storage, glass lined steel structure, 100,000-200,000 cubic foot | 1621 | Includes materials, equipment and labor to install a steel glass lined structure (based on typical 112' diameter X 19' height) . Includes materials, equipment and labor. | Cubic Feet | $2.52 | 187094 | $471,476.88 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #8 - Tank, Above Ground >200K cuft storage

**Scenario Description:**

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of greater than 200,000 ft3. Payment based on struck full volume. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Solid/Liquid Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design size : design storage volume of 241,669 CF plus 0.5' of freeboard ; based on 129' X 19' glass lined steel tank. Struck full = 248,200 CF

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 248,200.00

**Scenario Total Cost:** $721,334.77

**Scenario Cost/Unit:** $2.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 0 | $0.00 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 202 | $83,183.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 68 | $36,740.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1240 | $5,220.40 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 1240 | $4,774.00 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 227 | $7,071.05 |
| Waste Storage, glass lined steel structure >200,000 cubic foot | 1622 | Includes materials, equipment and labor to install a steel glass lined structure (based on typical 129' diameter X 19' height) . Includes materials, equipment and labor. | Cubic Feet | $2.35 | 248200 | $583,270.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #9 - Drystack, earthen floor, no wall

**Scenario Description:**

This scenario consists of a dry stack facility with compacted earthen floor without side walls. This scenario is intended for dryer material such as poultry litter. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water.

Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.00

**Scenario Total Cost:** $2,153.14

**Scenario Cost/Unit:** $0.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 148 | $623.08 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 148 | $569.80 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #10 - Dry stack, earthen floor, wood wall

**Scenario Description:**

This scenario consists of a dry stack facility with compacted earthen floor with wooden walls, posts and a concrete curb. This scenario is intended for dryer material such as poultry litter. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This option appropriate for sites where stacked materials are light weight and/or small equipment is used or when operation has similar structures. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor. Walls are 5' pressure treated wood (2" x 8" boards), 6" x 6" x 8' posts set 4' c-c with 6" concrete curbing. Walls allow for greater storage volume. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.00

**Scenario Total Cost:** $25,388.38

**Scenario Cost/Unit:** $6.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 18 | $9,725.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 148 | $623.08 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 148 | $569.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 90 | $2,899.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 1600 | $3,824.00 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 1248 | $5,715.84 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #11 - Dry Stack, earthen floor, concrete wall

**Scenario Description:**

This scenario consists of a dry stack facility with compacted earthen floor with concrete walls. This scenario is intended for dryer material such as poultry litter. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical is 4,000 SqFt (40' x 100'). The earthen floor will be prepared by stripping the top 1' of soil and roller compacting it back into floor. Walls are 5' reinforced concrete. Use this option when heavier material is piled and/ or large equipment is used to handle materials that requires a more structural wall. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.00

**Scenario Total Cost:** $48,782.03

**Scenario Cost/Unit:** $12.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 80 | $43,224.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 148 | $623.08 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 108 | $692.28 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 16 | $1,435.52 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 148 | $569.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #12 - Dry Stack, <2K Concrete Fl walls

**Scenario Description:**

This scenario consists of a small dry stack facility with reinforced concrete floor and concrete walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. Concrete walls allow heavier material to be piled and/ or handle impact from larger handling equipment. Typical size 40'x40' with a 4' wall on top of 1' concrete curb on three sides. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical is 1,600 SqFt (40' x 40). The facility floor is 5" reinforced concrete with 4'-6' high reinforced concrete walls. Walls allow for greater storage volume. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Square foot floor area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,600.00

**Scenario Total Cost:** $34,966.97

**Scenario Cost/Unit:** $21.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 23 | $9,471.40 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 38 | $20,531.40 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 59 | $151.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 68 | $286.28 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 77 | $279.51 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 30 | $934.50 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #13 - Dry Stack, 2K> Concrete Fl wall

**Scenario Description:**

This scenario consists of a larger dry stack facility with reinforced concrete floor and concrete walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. Concrete walls allow heavier material to be piled and/ or handle impact from larger handling equipment. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical is 6,000 SqFt (60' x 100'). The facility floor is 5" reinforced concrete with 4'-6' high reinforced concrete walls. Walls allow for greater storage volume and heavier floor for larger equipment load. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 6,000.00

**Scenario Total Cost:** $95,392.96

**Scenario Cost/Unit:** $15.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 89 | $36,650.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 81 | $43,764.30 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 511 | $2,151.31 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 578 | $2,098.14 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 8 | $756.08 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 445 | $1,713.25 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 112 | $3,488.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 4 | $1,920.52 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #14 - Dry Stack, concrete floor, no wall

**Scenario Description:**

This scenario consists of a dry stack facility with reinforced concrete floor without side walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. Use this scenario where there is sufficient space for sloping material. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical is 4,000 SqFt (40' x 100'). The facility floor is 5" reinforced concrete without side walls. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.00

**Scenario Total Cost:** $30,501.90

**Scenario Cost/Unit:** $7.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 64 | $26,355.20 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 74 | $311.54 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 148 | $569.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 74 | $2,305.10 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #15 - Dry Stack, concrete floor, wood wall

**Scenario Description:**

This scenario consists of a dry stack facility with reinforced concrete Floor with pressure treated wood walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. Site limitations require stacking materials to save space and wooden walls are sufficient to handle the light weight materials loads and small equipment impacts. The purpose of this practice is to temporarily, properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential
Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical is 4,000 SqFt (40' x 100'). The facility floor is 5" reinforced concrete with 5' pressure treated wood (2" x 8" boards) walls, 6"x 6" x 8' posts set 4' c-c with 6" high 8" thick concrete curbing. Walls allow for greater storage volume. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.00

**Scenario Total Cost:** $48,344.54

**Scenario Cost/Unit:** $12.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 64 | $26,355.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 10 | $5,403.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 74 | $311.54 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 148 | $569.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 90 | $2,899.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 74 | $2,305.10 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 1600 | $3,824.00 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 1248 | $5,715.84 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #16 - Tank, <5K

**Scenario Description:**

This scenario consists of installing a small tank (typically concrete) with a design storage volume of less than 5,000 CF that is totally or partially buried and has solid lid with several openings for direct loading from heavy use area, gutter cleaner or gravity pipe. Manure is held for 3 to 14 day on smaller operations or transferred to larger storage facility or direct land applied. Includes leak detection line. Outlet paid separately starting at edge of tank. Payment volume based on struck full. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533),and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled by the collection at the source and stored temporarily at an environmentally suitable location until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank typically 8' deep x 12' wide x 40' long, with an operational storage volume of 3,600 cubic feet plus 6" freeboard. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Tanks associated with open lots sized to handle design storm in tank or in combination with lot as per state regulations. Payment based on struck full volume = 3,840 CF

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 3,840.00

**Scenario Total Cost:** $34,712.38

**Scenario Cost/Unit:** $9.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 48 | $25,934.40 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 150 | $961.50 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 14 | $1,751.54 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 8 | $1,193.92 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 14 | $697.34 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 17 | $516.12 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 104 | $995.28 |
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 125 | $222.50 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 6 | $416.64 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #17 - Tank, 5K<15K

**Scenario Description:**

This scenario consists of installing a tank (typically concrete) that has a design storage volume from 5,000 to 14,999 CF that is totally or partially buried and has an open top. The tank can also be under an animal facility with the top cover of either slats or solid concrete lid/floor. Includes leak detection line around tank. Outlet paid separately starting at edge of tank. Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank typically 8' deep, with a bottom area of 1256 SF, and an operational storage volume of 9,420 cubic feet plus 6" freeboard. Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Payment based on struck full volume = 10,048 CF.

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 10,048.00

**Scenario Total Cost:** $40,845.75

**Scenario Cost/Unit:** $4.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 28 | $11,530.40 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 26 | $14,047.80 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 200 | $1,282.00 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 24 | $3,002.64 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 8 | $1,193.92 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 48 | $2,390.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 33 | $1,027.95 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 126 | $1,205.82 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 1746 | $1,361.88 |
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 152 | $270.56 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 6 | $416.64 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #18 - Tank, 15K<25K CF

**Scenario Description:**

This scenario consists of installing a concrete tank that has a design storage volume from 15,000 to 24,999 CF. The tank is totally or partially buried and has an open top. It can be under an animal facility with the top cover being slats or concrete lid/floor. Includes leak detection line. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533) and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank is typically 8 ft deep, with a bottom area of 2122 sq.ft., and an operational storage volume of 15920 cubic feet plus 6” freeboard. Size based on design volume of manure, other wastes, rainfall, lot runoff, etc as appropriate and includes the 6” of freeboard. Payment based on Struck Full Volume = 16979 cf

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 16,979.00

**Scenario Total Cost:** $61,906.57

**Scenario Cost/Unit:** $3.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 45 | $18,531.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 34 | $18,370.20 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 240 | $1,538.40 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 32 | $4,003.52 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 32 | $3,024.32 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 10 | $1,492.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 64 | $3,187.84 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 32 | $1,712.32 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 52 | $1,619.80 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 163 | $1,559.91 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 2950 | $2,301.00 |
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 196 | $348.88 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 8 | $555.52 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #19 - Tank, 25K<40K CF

**Scenario Description:**

This scenario consists of installing a tank (typically concrete) that has a design storage volume from 25,000 to 39,999 CF. Tank is totally or partially buried and has an open top. Tank can be under a animal facility with the top cover being slats or concrete lid/floor. Includes cost of leak detection line and observation well. Outlet paid separately starting at edge of tank. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank installed is 10' deep, with a bottom area of 2,947 SF, and an operational storage volume of 28,000 cubic feet plus 6" freeboard. Size based on manure, other wastes, rainfall, lot runoff, etc as appropriate. Payment based on Struck Full Volume = 29,470 CF used for this scenario.

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 29,470.00

**Scenario Total Cost:** $93,366.05

**Scenario Cost/Unit:** $3.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 56 | $23,060.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 67 | $36,200.10 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 350 | $2,243.50 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 45 | $5,987.25 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 45 | $4,252.95 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 12 | $1,790.88 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 45 | $2,302.20 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 22 | $708.84 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 90 | $4,482.90 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 45 | $2,407.95 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 70 | $2,180.50 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 192 | $1,837.44 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 4096 | $3,194.88 |
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 288 | $512.64 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 10 | $694.40 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #20 - Tank, 40K<55K CF

**Scenario Description:**

This scenario consists of installing a tank (typically concrete) that has a design storage volume from 25,000 to 54,999 CF. Tank is totally or partially buried and has an open top. Tank can be under a animal facility with the top cover being slats or concrete lid/floor. Includes cost of leak detection line/toe drain around perimeter. Outlet paid separately, starting at edge of tank. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank installed is 10' deep, with a inside bottom area of 4,600 SF, and an operational storage volume of 43,700 cubic feet plus 6" freeboard. Payment based on struck full volume of 46,000 CF which is storage volume, regulatory freeboard and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 46,000.00

**Scenario Total Cost:** $127,014.41

**Scenario Cost/Unit:** $2.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 88 | $36,238.40 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 84 | $45,385.20 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 426 | $2,730.66 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 62 | $8,249.10 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 62 | $5,859.62 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 12 | $1,790.88 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 34 | $1,095.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 124 | $6,176.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 103 | $3,208.45 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 240 | $2,296.80 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 6394 | $4,987.32 |
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 288 | $512.64 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 10 | $694.40 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #21 - Tank, 55K<70K CF

**Scenario Description:**

This scenario consists of installing a tank (typically concrete) that has a design storage volume from 55,000 to 69,999 CF. Tank is totally or partially buried and has an open top, however it can be under a animal facility with the top cover with slats or concrete lid/floor. Includes cost of leak detection line /toe drain around perimeter. Outlet paid separately starting at edge of tank. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices:Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank is typically 12' deep, with a bottom area of 5,391 SF, and an operational storage volume of 62,000 CF plus 6" freeboard. Payment based on struck full volume of 64,692 CF which includes storage volume, regulatory freeboard and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 64,692.00

**Scenario Total Cost:** $160,283.72

**Scenario Cost/Unit:** $2.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 103 | $42,415.40 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 124 | $66,997.20 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 650 | $4,166.50 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 70 | $9,313.50 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 70 | $6,615.70 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 12 | $1,790.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 70 | $3,745.70 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 70 | $9,259.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 120 | $3,738.00 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 260 | $2,488.20 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 7493 | $5,844.54 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 312 | $555.36 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 8 | $555.52 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #22 - Tank, 70K<85K CF

**Scenario Description:**

This scenario consists of installing a tank (typically concrete) that has a design storage volume from 70,000 to 84,999 CF. Tank is totally or partially buried and has an open top, however it can be under a animal facility with the top cover with slats or concrete lid/floor. Includes cost of leak detection line/toe drain around the perimeter. Outlet paid separately starting at edge of tank. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank is typically 12' deep, with a bottom area of 6500.6 SF, and an operational storage volume of 74,757 CF plus 6" freeboard. Payment based on struck full volume of 78,007 CF which includes storage volume, regulatory freeboard, and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 78,007.00

**Scenario Total Cost:** $170,479.24

**Scenario Cost/Unit:** $2.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 127 | $52,298.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 109 | $58,892.70 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 700 | $4,487.00 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 80 | $10,644.00 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 80 | $7,560.80 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 12 | $1,790.88 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 49 | $1,578.78 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 160 | $7,969.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 80 | $4,280.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 142 | $4,423.30 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 286 | $2,737.02 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 9036 | $7,048.08 |
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 343 | $610.54 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 8 | $555.52 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #23 - Tank, 85K<125K CF

**Scenario Description:**

This scenario consists of installing a concrete tank that has a design storage volume from 85,000 to 124,999 CF. Tank is totally or partially buried and has an open top. Tank can also be under an animal facility with the top cover using slats or concrete lid/floor. Includes cost of leak detection line /toe drain around perimeter of tank. Outlet paid separately starting at edge of tank. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank is typically 12' deep, with a bottom area of 8,044 SF, and an operational storage capacity of 92,500 cubic feet plus 6" freeboard. Payment based on Struck Full Volume of 95,528 CF which is design storage volume, regulatory freeboard, and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 95,528.00

**Scenario Total Cost:** $177,181.39

**Scenario Cost/Unit:** $1.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 154 | $63,417.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 121 | $65,376.30 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 800 | $5,128.00 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 8 | $1,064.40 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 8 | $756.08 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 14 | $2,089.36 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 2700 | $10,395.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 80 | $4,280.80 |
| **Materials** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 173 | $5,388.95 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 318 | $3,043.26 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 11181 | $8,721.18 |
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 382 | $679.96 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 8 | $555.52 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #25 - Tank, 125K or > CF

**Scenario Description:**

This scenario consists of installing a concrete tank that has a design storage volume of 125,000 or more CF. Tank is totally or partially buried and has an open top. Tank can also be under a animal facility with the top cover using slats or concrete lid/floor. Includes cost of perimeter drain and observation well. Outlet paid separately starting at edge of tank. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank typically 14' deep with a bottom area of 11,304 SF and an operational storage volume of 152,600 CF plus 6" freeboard. Payment based on struck full volume of 158,256 CF which includes storage volume, regulatory freeboard, and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Struck Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 158,256.00

**Scenario Total Cost:** $246,835.38

**Scenario Cost/Unit:** $1.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 206 | $84,830.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 167 | $90,230.10 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 1400 | $8,974.00 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 24 | $3,193.20 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 24 | $2,268.24 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 14 | $2,089.36 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 4700 | $18,095.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 48 | $2,455.68 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 84 | $2,706.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 48 | $2,390.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 64 | $3,424.64 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 239 | $7,444.85 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 377 | $3,607.89 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 15712 | $12,255.36 |
| Pipe, HDPE, 4 in. CPT, Single Wall with Filter Sock | 2068 | 4 inch plastic tile with filter sock. Materials only. | Feet | $1.78 | 452 | $804.56 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 8 | $555.52 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 6 | $1,508.82 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #26 - Composted Bedded Pack, Earthen Floor, Concrete Wall

**Scenario Description:**

A composted bedded pack facility is constructed to store wastes as part of an agricultural waste management system. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Roofs and Covers (367).

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

Using a bedded pack provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design: floor area 4,000 ft2 , (40' X 100'); 4' concrete wall height, 3' footing depth with an earthen floor; 20' openings on each end of structure.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.00

**Scenario Total Cost:** $25,442.70

**Scenario Cost/Unit:** $6.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 42 | $22,692.60 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 22 | $56.32 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 74 | $311.54 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 22 | $141.02 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 198 | $718.74 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 102 | $92.82 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 74 | $284.90 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #27 - Composted Bedded Pack, Concrete Floor, Concrete Wall

**Scenario Description:**

A composted bedded pack facility is constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario is intended for situations where consistency of manure or geological conditions prohibit the use of earthen floors. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561) and Roofs and Covers (367).

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

Using a bedded pack provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical design: floor area 4,000 ft2, (40' X 100'); 4' concrete wall height, 3' footing depth with a 6" concrete floor; 20' openings on each end of structure.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,000.00

**Scenario Total Cost:** $47,000.25

**Scenario Cost/Unit:** $11.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 0 | $0.00 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 50 | $20,590.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 42 | $22,692.60 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 22 | $56.32 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 37 | $155.77 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 22 | $141.02 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 198 | $718.74 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 102 | $92.82 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 74 | $284.90 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 37 | $1,123.32 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #40 - Concrete, Rectangular, with Roof

**Scenario Description:**

This scenario consists of a rectangular concrete facility with reinforced concrete floor and concrete walls. This scenario shall be used in conjunction with 367 - Roofs and Covers. Walls are designed to support a roof. This scenario is intended to store liquid or dry manure (Ramp will be required to remove dry manure). The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 382-Fence, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical size is 4,368 Sq.Ft. (42' x 104'). The facility floor is 5" reinforced concrete with 8' reinforced concrete walls. Wall is designed to support a roof. Walls allow for greater storage volume. Manure and other agricultural by-products are collected and stored near the source until such time that the manure can be disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Strike Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 34,944.00

**Scenario Total Cost:** $165,735.48

**Scenario Cost/Unit:** $4.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 50 | $20,590.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 207 | $111,842.10 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 1660 | $6,025.80 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 8 | $1,193.92 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 1660 | $6,391.00 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hours | $15.45 | 4 | $61.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 54 | $1,739.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 104 | $3,239.60 |
| Cement, Type I or II | 1336 | Type I or II Portland Cement (94 lb. bag), Materials only. | Each | $17.62 | 257 | $4,528.34 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 292 | $2,794.44 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 3595 | $2,804.10 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #41 - Concrete, Rectangular, Without Roof up to 35K ft3 Storage

**Scenario Description:**

This scenario consists of a rectangular concrete facility with reinforced concrete floor and concrete walls. Walls are NOT designed to support a roof. This scenario is intended to store liquid or dry manure. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and groundwater. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

The typical size is 4,368 Sq.Ft. (42' x 104'). The facility floor is 5 inch reinforced concrete with 8' reinforced concrete walls. Wall is NOT designed to support a roof. Walls allow for greater storage volume. Backfill height required on walls is a minimum of 6 feet and a maximum of 8 feet, as per MA-WSF-06. Manure and other agricultural by-products are collected and stored near the source until such time that the manure can be disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

**Feature Measure:** Strike Full Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 34,944.00

**Scenario Total Cost:** $142,612.08

**Scenario Cost/Unit:** $4.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 50 | $20,590.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 171 | $92,391.30 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 1660 | $6,025.80 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 8 | $1,193.92 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 1660 | $6,391.00 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hours | $15.45 | 4 | $61.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 54 | $1,739.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 104 | $3,239.60 |
| Cement, Type I or II | 1336 | Type I or II Portland Cement (94 lb. bag), Materials only. | Each | $17.62 | 221 | $3,894.02 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 3595 | $2,804.10 |
| Waterstop, Bentonite, half-round, 3/4 in. x 3/8 in. | 2362 | Flexible and expandible bentonite strip for concrete construction. Half round profile of 3/4 inch x 3/8 inch. Includes materials and shipping only. | Feet | $2.83 | 292 | $826.36 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 314 - Brush Management

**Scenario** #1 - Hand tools, Woody Vegetation

**Scenario Description:**

Using hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to remove or cut off woody plants at of below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have stands of woody and non herbaceous species that are in the early phases of invasions. Typical unit is 10 acres. Associated Practices: Early Successional Habitat Development and Management (647), Restoration of Rare and Declining Habitats (643), Shallow Water Development and Management (646), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644)

**Before Situation:**

Area is in the very early phases of woody non herbaceous species encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

**After Situation:**

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,117.53

**Scenario Cost/Unit:** $411.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 25 | $166.25 |
| Brush Chipper, 6 in. capacity | 938 | Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hours | $32.57 | 25 | $814.25 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 25 | $58.75 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 25 | $1,279.00 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 50 | $1,611.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 314 - Brush Management

**Scenario** #2 - Hand Tools and Chemical Treatment

**Scenario Description:**

Using a combination of chemical treatment and hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to remove or cut off woody plants at of below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have stands of woody and non herbaceous species that are in the early phases of invasions. Typical unit is 10 acres. Associated Practices: Early Successional Habitat Development and Management (647), Restoration of Rare and Declining Habitats (643), Shallow Water Development and Management (646), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644)

**Before Situation:**

Area is in the very early phases of woody non herbaceous species encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

**After Situation:**

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $5,762.13

**Scenario Cost/Unit:** $576.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 25 | $166.25 |
| Brush Chipper, 6 in. capacity | 938 | Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hours | $32.57 | 25 | $814.25 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 20 | $1,316.20 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 25 | $58.75 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 25 | $1,279.00 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 50 | $1,611.00 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 5 | $254.30 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 314 - Brush Management

**Scenario** #3 - Mechanical, Light Equipment

**Scenario Description:**

Removal of small woody vegetation of heavy infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. Only the infestation of the area is treated. Typical unit is 10 acres. Associated Practices: Early Successional Habitat Development and Management (647), Restoration of Rare and Declining Habitats (643), Shallow Water Development and Management (646), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644)

**Before Situation:**

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,083.48

**Scenario Cost/Unit:** $108.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 10 | $306.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 314 - Brush Management

**Scenario** #4 - Mechanical, Heavy, > 4 Inches DBH

**Scenario Description:**

Removal of large woody vegetation of heavy infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the heavy infestation. Only the infestation of the area is treated. Typical unit is 10 acres.

**Before Situation:**

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $8,773.14

**Scenario Cost/Unit:** $877.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Feller buncher | 941 | Equipment and power unit costs. Labor not included. | Hours | $153.24 | 40 | $6,129.60 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 40 | $1,992.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 314 - Brush Management

**Scenario** #5 - Light Mechanical and Chemical

**Scenario Description:**

Removal of small woody vegetation of heavy infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment t followed by an application of low cost chemicals in low volumes of material in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the heavy infestation. Only the infestation of the area is treated.Typical unit is 10 acres.

**Before Situation:**

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,517.38

**Scenario Cost/Unit:** $451.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 30 | $918.60 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 30 | $1,974.30 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 30 | $1,020.60 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 314 - Brush Management

**Scenario** #6 - Chemical, Individual Plant Treatment

**Scenario Description:**

This Practice is for the implementation of brush management on range, pasture or native pasture using Individual Plant Treatment (IPT). The typical method of control is application of herbicides (basal or foliar location) on selected individual plants. Associated Practices: Early Successional Habitat Development and Management (647), Restoration of Rare and Declining Habitats (643), Shallow Water Development and Management (646), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644)

**Before Situation:**

Brush species exceed desired levels resulting in degraded plant condition, loss of forage production, or degraded wildlife habitat. Densities of brush exceed levels indicated in the ecological site descriptions.

**After Situation:**

Brush has been treated to a level which results in improved plant condition, forage production, or wildlife habitat. The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $1,186.55

**Scenario Cost/Unit:** $237.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 5 | $329.05 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 5 | $196.10 |

**Practice:** 314 - Brush Management

**Scenario** #7 - Chemical, Intense Individual Plant Treatment

**Scenario Description:**

Individual plant treatment (IPT) is applied to high density, heavy brush for treatment of a sensitive area, such as bog turtle habitat. The typical method of control is application of herbicides (basal or foliar location) on selected individual plants. Desirable plants are avoided and mitigation measures are implemented to avoid adverse effects on sensitive species. Associated Practices: Early Successional Habitat Development and Management (647), Restoration of Rare and Declining Habitats (643), Shallow Water Development and Management (646), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644)

**Before Situation:**

The existing stand consists of 70-90% unwanted/undesirable species. Undersirable species consist of hardwoods and shrubs that can propogate via root systems that make commercial control unfeasible.

**After Situation:**

Approximately 80% of undesirable species have been treated and killed. Small amounts of desirable plants species were left unharmed.

**Feature Measure:** Acre treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $880.01

**Scenario Cost/Unit:** $880.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 8 | $526.48 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 0.8 | $40.69 |

**Practice:** 314 - Brush Management

**Scenario** #8 - Chemical, Aerial Applied

**Scenario Description:**

Apply brush management on 10 acres of rangeland, grazed forest, or pasture thru the use of broadcast aerial application of material with low cost chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

**Before Situation:**

Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

**After Situation:**

A 10 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable deciduous species have been accomplished by broadcast or spot treatment chemical application to address plant, animal, and wildlife resource concerns.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $973.55

**Scenario Cost/Unit:** $97.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, aerial application, helicopter | 1991 | Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor. | Acres | $45.26 | 10 | $452.60 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 5 | $267.55 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $23.10 | 10 | $231.00 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 10 | $22.40 |

**Practice:** 314 - Brush Management

**Scenario** #30 - Mechanical, Medium 2 to 4 Inch DBH

**Scenario Description:**

Removal of medium woody vegetation (2 to 4 inches DBH) of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the heavy infestation. Only the infestation of the area is treated. Typical unit is 10 acres.

**Before Situation:**

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $5,670.86

**Scenario Cost/Unit:** $567.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 30 | $3,216.30 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 30 | $1,494.30 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 314 - Brush Management

**Scenario** #44 - Chemical - Ground Applied

**Scenario Description:**

Apply brush management on 160 acres of rangeland, grazed forest, or pasture thru the use of ground application of material using low cost chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

**Before Situation:**

Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

**After Situation:**

A 160 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable deciduous species have been accomplished by ground applied herbicides to address plant, animal, and wildlife resource concerns.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $27,897.49

**Scenario Cost/Unit:** $174.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Chemical, ground application, forested land | 1313 | Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs | Acres | $146.47 | 160 | $23,435.20 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $23.10 | 160 | $3,696.00 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 160 | $358.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 314 - Brush Management

**Scenario** #325 - Light Brush Management

**Scenario Description:**

Light brush management is used on non-cropland acres (including forestland, pasture, and wildlife areas) where less than 10% canopy cover across the treatment area is in undesireable non-herbaceous cover, and the treatment area is less than 18% slope on average. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

**Before Situation:**

Non-cropland acres consisting of a percentage of undesirable species such as (but not limited to) Amur cork tree, Siberian elm, callery pear, autumn olive, multi-flora rose, barberry, burning bush, honeysuckle, or periwinkle that must be controlled. Undesirable species can contribute to degraded plant condition, inadequate feed &forage, and potential animal health issues.

**After Situation:**

Undesirable non-herbaceous species are controlled with a pass with a brush hog over the treatment area followed by spot chemical treatment. The treatment area is mechanically treated early in the growing season to reduce above ground biomass. The treated plants will readily re-sprout, and after adequate re-sprouting occurs herbicide will be applied to the new growth. This combined treatment will allow better access for the herbicide application equipment, better coverage on target plants, and less overall herbicide applied.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $1,184.85

**Scenario Cost/Unit:** $47.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 6 | $183.72 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 8 | $526.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 2.5 | $98.05 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 314 - Brush Management

**Scenario** #326 - Medium Brush Management

**Scenario Description:**

Medium brush management is used on non-cropland acres (including forestland, pasture, and wildlife areas) where 10% - 39% canopy cover across the treatment area is in undesirable non-herbaceous cover, and the treatment area is less than 18% slope on average. Payment is based on impacted acres only. Treatment may consist of chemical, mechanical, manual, or a combination of methods. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

**Before Situation:**

Non-cropland acres consisting of a percentage of undesirable species such as (but not limited to) Amur cork tree, Siberian elm, callery pear, autumn olive, multi-flora rose, barberry, burning bush, honeysuckle, or periwinkle that must be controlled. Undesirable species can contribute to degraded plant condition, inadequate feed &forage, and potential animal health issues.

**After Situation:**

Undesirable non-herbaceous species are controlled with a pass with a brush hog over the treatment area followed by spot chemical treatment. The treatment area is mechanically treated early in the growing season to reduce above ground biomass. The treated plants will readily re-sprout, and after adequate re-sprouting occurs herbicide will be applied to the new growth. This combined treatment will allow better access for the herbicide application equipment, better coverage on target plants, and less overall herbicide applied.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $1,889.61

**Scenario Cost/Unit:** $75.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 12 | $367.44 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 10 | $658.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 14 | $451.08 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 7.5 | $294.15 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 314 - Brush Management

**Scenario** #332 - Blanket Treatment Multi Pass

**Scenario Description:**

Blanket treatment multi pass brush management is used where a blanket treatment approach is acceptable and multiple passes or approaches are needed to control non-desirable brush. This practice applies to persistent brush that must be treated at least twice in a growing season. The practice entails the treatment of brush using chemical applications or mechanical operations, or a combination of chemical and mechanical, such as cutting brush then chemically treating stumps. Addresses resource concerns of inadequate wildlife habitat and degraded plant condition.

**Before Situation:**

Area consists of undesirable and persistent brush, degrading wildlife habitat as well as plant structure, composition and condition.

**After Situation:**

Undesirable, persistent brush is removed to achieve the desired plant community based on species composition, structure, density, and canopy cover or height. Plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $12,842.38

**Scenario Cost/Unit:** $1,284.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 50 | $332.50 |
| Brush Chipper, 6 in. capacity | 938 | Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hours | $32.57 | 50 | $1,628.50 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 20 | $1,316.20 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 50 | $117.50 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 50 | $2,558.00 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 100 | $3,222.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 20 | $784.40 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 314 - Brush Management

**Scenario** #349 - Biological Brush Management High Density

**Scenario Description:**

Management of woody plant species through the use of livestock that are closely herded to concentrate grazing on targeted shrubs. Typical areas have dense stands of woody non-herbaceous species that exceed the desirable ecological site condition. Undesirable non- herbaceous vegetation may be present and impairing the desired ecological site condition. Targeted grazing herd is mobilized to site. Typical herd size 100-300 head. Goal is for maximum defoliation of brush.

**Before Situation:**

Area consist of dense stands of woody non-herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

**After Situation:**

Woody species are grazed to limit the regrowth of targeted shrubs and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, affected hydrology and plant health and vigor is returning to near normal levels.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $13,689.56

**Scenario Cost/Unit:** $1,368.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Animals used for biological weed control | 1130 | Goats, Llamas, Sheep, Cattle - Turn-key operation, includes all supporting costs: fence, water, dog, mobilization, herd labor, other labor, etc. Includes materials, equipment, labor, and mobilization. | Head per day | $8.35 | 1500 | $12,525.00 |

**Practice:** 314 - Brush Management

**Scenario** #350 - Biological Brush Management Low Density

**Scenario Description:**

Management of woody plant species through the use of livestock that are closely herded to concentrate grazing on targeted shrubs. Typical areas have dense stands of woody non-herbaceous species that exceed the desirable ecological site condition. Undesirable non-herbaceous vegetation may be present and impairing the desired ecological site condition. Targeted grazing herd is mobilized to site. Typical herd size less than 100 head.

**Before Situation:**

Area consist of dense stands of woody non-herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

**After Situation:**

Woody species are grazed to limit the regrowth of targeted shrubs and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, affected hydrology and plant health and vigor is returning to near normal levels. Implementation is consistent with the Brush Management 314 plan and specifications.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $6,844.78

**Scenario Cost/Unit:** $684.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 4 | $74.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Animals used for biological weed control | 1130 | Goats, Llamas, Sheep, Cattle - Turn-key operation, includes all supporting costs: fence, water, dog, mobilization, herd labor, other labor, etc. Includes materials, equipment, labor, and mobilization. | Head per day | $8.35 | 750 | $6,262.50 |

**Practice:** 314 - Brush Management

**Scenario** #364 - Brush Management for 1 Ac. or less

**Scenario Description:**

Using hand tools and small power tools to remove or cut off invasive woody plants at or below the root collar. Typically this scenario is for woody and non-herbaceous species that are in early phases of invasion and are degrading herbaceous plant health and vigor for the 1 acre small farm.

**Before Situation:**

Small farm area is in various phases of woody non-herbaceous species enroachment that degrades the biotic integrity of the site resulting in poor herbaceous plant health and vigor. Continued degradation results in increased invasive woody species and poor hydrological site characteristics.

**After Situation:**

Woody species are removed to achieve desirable biotic conditions for herbaceous plant health and vigor. Hydrological site characteristics and plant health and vigor are improved, and plant pest pressure from invasive woody species is reduced.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $417.13

**Scenario Cost/Unit:** $417.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1 | $6.65 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 3 | $91.86 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 2 | $4.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #1 - Hand Tools, Herbaceous vegetation

**Scenario Description:**

Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at of below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 10 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitat Management (645), Early Successional Habitat Development/Management (647), Prescribed Grazing (528), Forage and Biomass Planting (512)

**Before Situation:**

Area is in the very early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

**After Situation:**

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,752.30

**Scenario Cost/Unit:** $175.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 4 | $74.20 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 40 | $94.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #2 - Mechanical

**Scenario Description:**

Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition. Weed has exceeded desired levels based on ecological site potential. Typical unit is 10 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitiat Management (645), Early Successional Habitat Development/Management (647),Prescribed Grazing (528), Forage and Biomass Planting (512).

**Before Situation:**

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,083.48

**Scenario Cost/Unit:** $108.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 10 | $306.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #3 - Chemical, Spot

**Scenario Description:**

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment, either initial or retreatment using hand-carried equipment (such as a backpack and hand-sprayer) to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition. Typical unit is 20 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitiat Management (645), Early Successional Habitat Development/Management (647),Prescribed Grazing (528), Forage and Biomass Planting (512)

**Before Situation:**

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $1,595.26

**Scenario Cost/Unit:** $79.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 20 | $1,316.20 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 5 | $92.75 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 5 | $83.40 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #4 - Chemical, Ground

**Scenario Description:**

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using ground equipment to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition. Typical unit is 20 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitiat Management (645), Early Successional Habitat Development/Management (647),Prescribed Grazing (528), Forage and Biomass Planting (512)

**Before Situation:**

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $780.48

**Scenario Cost/Unit:** $39.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 20 | $121.00 |
| **Materials** | | | | | | |
| Herbicide, 2,4-D | 330 | Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $13.82 | 20 | $276.40 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 20 | $44.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #5 - Chemical, Aerial

**Scenario Description:**

Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using airplane or helicopter to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition. Typical unit is 20 acres. Associated Practices: Brush Management (314), Conservation Cover (327), Critical Area Planting (342), Upland Wildlife Habitiat Management (645), Early Successional Habitat Development/Management (647),Prescribed Grazing (528), Forage and Biomass Planting (512)

**Before Situation:**

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $2,261.32

**Scenario Cost/Unit:** $113.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Chemical, aerial application, helicopter | 1991 | Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor. | Acres | $45.26 | 20 | $905.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Herbicide, 2,4-D | 330 | Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $13.82 | 20 | $276.40 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 20 | $44.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #16 - Forest Herbaceous Chemical Ground

**Scenario Description:**

The practice entails the eradication of target, interfering herbaceous species using ground applied chemicals to allow regeneration of desirable tree species and the establishment of quality wildlife habitat. Removal is supervised to ensure objectives are achieved. Typical unit is 20 acres.

**Before Situation:**

An adequately stocked forest stand of desirable tree species is overwhelmed by extensive stands of herbaceous weeds in its understory, degrading health and vigor and diversity of native tree regeneration, as well as herbaceous species, shrub species and degrading wildlife habitat.

**After Situation:**

After a foliar herbicide treatment was applied to the forest stand's understory, the desirable forest understory has been released from excessive competition. Ecological site condition is progressing in an upward trend, with plant health and vigor returning to desired levels and wildlife habitat improving.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $4,527.24

**Scenario Cost/Unit:** $226.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application, forested land | 1313 | Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs | Acres | $146.47 | 20 | $2,929.40 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 7 | $925.96 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 20 | $333.60 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #37 - mechanical and chemical

**Scenario Description:**

Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition, then applying herbicide to control re-growth of target weeds. Weed has exceeded desired levels based on ecological site potential. Typical unit is 10 acres.

**Before Situation:**

Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

**After Situation:**

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

**Feature Measure:** acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,199.15

**Scenario Cost/Unit:** $119.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 5 | $153.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 2 | $37.10 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 10 | $508.60 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 10 | $22.40 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #38 - Blanket Treatment Multi Pass

**Scenario Description:**

Blanket treatment multi pass herbaceous weed control is used on non-cropland acres (including forestland, pasture, and idle areas) where a blanket treatment approach is acceptable and multiple passes or approaches are needed to control the non-desirable weeds. Payment is based on impacted acres only. The practice entails the treatment of weeds using multiple blanket chemical applications or multiple mechanical brush hog operations, or a combination of chemical and mechanical. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

**Before Situation:**

Area consists of herbaceous weed species such as sericia lespedeza, japanese stilt grass, periwinkle, ironweed, ragweed, etc. that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

**After Situation:**

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $3,224.50

**Scenario Cost/Unit:** $128.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 6 | $183.72 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 50 | $302.50 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 50 | $1,961.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #39 - Light Spot Treatment

**Scenario Description:**

Light spot treatment herbaceous weed control is used on non-cropland acres (including forestland, pasture, and idle areas) where less than 10% canopy coverage across the treatment area is in undesireable herbaceous cover, or a specific area spot treatment is needed such as creating open ground under a wildlife habitat structure . Payment is based on impacted acres only. The practice entails the treatment of weeds using small equipment (such as an ATV with sprayer) to apply chemicals, or using hand tools (such as axes, shovels, hoes, nippers) to remove or cut off herbaceous plants at or below the root collar. Cost represents typical situations for conventional, organic, and transitioning to organic producers. For organic land, chemical applications must be OMRI approved chemicals.

**Before Situation:**

Area consists of herbaceous weed species such as sericia lespedeza, japanese stilt grass, periwinkle, ironweed, ragweed, etc. that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

**After Situation:**

Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $807.81

**Scenario Cost/Unit:** $32.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 8 | $526.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 2.5 | $98.05 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #61 - Biological Management High Density

**Scenario Description:**

Management of herbaceous plant species through the use of livestock that are closely herded to concentrate grazing on targeted plants. Typical areas have high density stands of herbaceous species that exceed the desirable ecological site condition. Undesirable herbaceous vegetation may be present and impairing the desired ecological site condition. Targeted grazing herd is mobilized to site. Typical herd size 100-300 head. Goal is for maximum consumption of herbaceous plants.

**Before Situation:**

Area consist of dense stands of herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

**After Situation:**

Herbaceous species are grazed to limit the regrowth and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, affected hydrology and plant health and vigor is returning to near normal levels.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $9,514.56

**Scenario Cost/Unit:** $951.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Animals used for biological weed control | 1130 | Goats, Llamas, Sheep, Cattle - Turn-key operation, includes all supporting costs: fence, water, dog, mobilization, herd labor, other labor, etc. Includes materials, equipment, labor, and mobilization. | Head per day | $8.35 | 1000 | $8,350.00 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #62 - Biological Management Low Density

**Scenario Description:**

Management of herbaceous plant species through the use of livestock that are closely herded to concentrate grazing on targeted plants. Typical areas have light density stands of herbaceous species that exceed the desirable ecological site condition. Undesirable herbaceous vegetation may be present and impairing the desired ecological site condition. Targeted grazing herd is mobilized to site. Typical herd size< 100 head. Goal is for maximum consumption of herbaceous plants.

**Before Situation:**

Area consist of dense stands of herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

**After Situation:**

Herbaceous species are grazed to limit the regrowth of targeted plants and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, affected hydrology and plant health and vigor is returning to near normal levels. Implementation is consistent with the Herbaceous Weed Management 315 plan and specifications.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,757.28

**Scenario Cost/Unit:** $475.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 4 | $74.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Animals used for biological weed control | 1130 | Goats, Llamas, Sheep, Cattle - Turn-key operation, includes all supporting costs: fence, water, dog, mobilization, herd labor, other labor, etc. Includes materials, equipment, labor, and mobilization. | Head per day | $8.35 | 500 | $4,175.00 |

**Practice:** 315 - Herbaceous Weed Treatment

**Scenario** #73 - Herbaceous Weed Treatment for One Acre Small Farm

**Scenario Description:**

Using hand and small power tools to remove or cut off herbaceous invasive plants at or below the root collar. Typically this scenario is for herbaceous invasive species that are degrading the 1 acre small farm.

**Before Situation:**

Small farm area is in various phases of herbaceous species enroachment that degrades the biotic integrity resulting in poor plant health and vigor, and/or wildlife habitat. Continued degradation results in increased plant pest pressure, loss of plant diversity and biotic integrity, and poor hydrological characteristics.

**After Situation:**

Herbaceous species are removed to achieve desirable biotic conditions and improved plant health and vigor, and/or wildlife habitat. Hydrological site characteristics are improved, and plant pest pressure from invasive herbaceous species are reduced.

**Feature Measure:** acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $252.58

**Scenario Cost/Unit:** $252.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 1 | $30.62 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 2 | $4.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #1 - < 50 CF Incineration Chamber

**Scenario Description:**

A manufactured Type IV incinerator is installed to handle less than 350 lbs of average daily mortality for the species and size of operation. A high temperature (greater than 1,300 degrees F) is used for incineration with a secondary combustion or after burner chamber prior to flue discharge. The smallest incinerator that meets capacity is used for the average daily mortality rate (in pounds). The payment is made per unit of actual chamber size obtained from the manufacturer's product literature. This practice addresses resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are also addressed. Non-attainment areas may require higher level of processing such as gasification to meet additional air quality requirements. Associated Practices: Access Road (560), Critical Area Planting (342), Fence (382), Heavy Use Area Protection (561),Nutrient Management (590), Roofs and Covers (367), and Waste Storage Facility (313).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations. Payment includes a concrete slab to set the incinerator on and a fuel tank. The ash materials are stored in suitable containers until land disposal as per the nutrient management plan.

**Feature Measure:** Incinerator Chamber Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 44.00

**Scenario Total Cost:** $14,078.04

**Scenario Cost/Unit:** $319.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 4 | $1,647.20 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 8 | $20.48 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 1 | $125.11 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 4 | $124.60 |
| Fuel Tank, Anchored | 1033 | Fuel tank for operating incinerators and/or gasifiers. Materials only. | Gallons | $5.22 | 285 | $1,487.70 |
| Incinerator, 200 lbs/day | 1624 | Poultry and livestock incinerator with an approximate chamber capacity of 200 pounds per day. Includes equipment and after burner only. | Each | $10,103.77 | 1 | $10,103.77 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #2 - 50-100CF Incineration chamber

**Scenario Description:**

A manufactured Type IV incinerator is installed to handle 350 to 850 lbs of average daily mortality for the species and size of operation such as a very large poultry or medium sized swine operations. A high temperature (greater than 1,300 degrees F) is used for incineration with a secondary combustion or after burner chamber prior to flue discharge. The smallest incinerator that meets capacity is used for the average daily mortality rate (in pounds). The payment is made per unit of actual chamber size obtained from the manufacturer's product literature. This practice addresses resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are also addressed. Non-attainment areas may require higher level of processing such as gasification to meet additional air quality requirements. Associated Practices: Access Road (560), Critical Area Planting (342), Fence (382), Heavy Use Area Protection (561),Nutrient Management (590), Roofs and Covers (367), and Waste Storage Facility (313).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations. Payment includes a concrete slab to set the incinerator on and a fuel tank. The ash materials are stored in suitable containers until land disposal as per the nutrient management plan.

**Feature Measure:** Incinerator Chamber Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 56.00

**Scenario Total Cost:** $15,098.85

**Scenario Cost/Unit:** $269.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 4 | $1,647.20 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 8 | $20.48 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 1 | $125.11 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 4 | $124.60 |
| Fuel Tank, Anchored | 1033 | Fuel tank for operating incinerators and/or gasifiers. Materials only. | Gallons | $5.22 | 285 | $1,487.70 |
| Incinerator, 400 lbs/day | 1625 | Poultry and livestock incinerator with an approximate chamber capacity of 400 pounds per day. Includes equipment and after burner only. | Each | $11,124.58 | 1 | $11,124.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #3 - >100 CF Incineration Chamber

**Scenario Description:**

A manufactured Type IV incinerator is installed to handle a single 1,200 to 1,500 lb mortality (a single cow or multiple heifers or swine). A high temperature (greater than 1,300 degrees F) is used for incineration with a secondary combustion or after burner chamber prior to flue discharge. The smallest incinerator that meets capacity is used to handle the largest individual mortality. This type of incinerator typically uses a very small footprint, but requires 15-20 gallons of diesel fuel per fill. In order to be cost effective, the usage needs to be significant unless regulations or severe site limitations require this type of facility. The payment is made per unit of actual chamber size obtained from the manufacturer's product literature. This practice addresses resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are also addressed. Non-attainment areas may require higher level of processing such as gasification to meet additional air quality requirements. Associated Practices: Access Road (560), Critical Area Planting (342), Fence (382), Heavy Use Area Protection (561),Nutrient Management (590), Roofs and Covers (367), and Waste Storage Facility (313).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations. Payment includes a concrete slab to set the incinerator on and a fuel tank. The ash materials are stored in suitable containers until land disposal as per the nutrient management plan.

**Feature Measure:** Incineration Chamber Volume

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 120.00

**Scenario Total Cost:** $16,722.01

**Scenario Cost/Unit:** $139.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 4 | $1,647.20 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 8 | $20.48 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 1 | $125.11 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 4 | $124.60 |
| Fuel Tank, Anchored | 1033 | Fuel tank for operating incinerators and/or gasifiers. Materials only. | Gallons | $5.22 | 285 | $1,487.70 |
| Incinerator, 600 lbs/day | 1626 | Poultry and livestock incinerator with an approximate chamber capacity of 600 pounds per day. Includes equipment and after burner only. | Each | $12,747.74 | 1 | $12,747.74 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #4 - Invessel Rotary Drum

**Scenario Description:**

A horizontal rotary drum is installed to compost small poultry and swine facility mortality. The facility can handle between 250 and 600 lbs per day of mortality, plus equal or higher volumes of carbon material (i.e. wood chips). A secondary composting storage area is required to finish materials. The payment quantity is based on the interior volume of the rotary composter in cubic feet of the smallest drum that can process the daily mortality as per manufacturer's recommendations. This practice addresses resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are also addressed. Associated Practices: Access Road (560), Critical Area Planting (342), Diversion (362), Fence (382), Nutrient Management (590), Roofs and Covers (367), Structure for Water Control (587), Subsurface Drain (606), Underground Outlet (620), and Waste Storage Facility (313).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

A 5' diameter, 22' long rotary drum is installed on two concrete pads that can process 325 lbs of mortality per day. Drum rotation moves and mixes mortality and wood chips. Site preparation includes topsoil removal, gravel sub-base, and concrete pads and slab at two locations plus small floor and walls to complete composting. Input material reduced by 40-60 percent and put into 4' high, three sided, 20'x 20' concrete bin with 10'x20 concrete pad for secondary composting. Area can be protected by adding Roofs and Covers (367 ) standard. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Average pounds of mortality per da

**Scenario Unit:** Pounds per Day

**Scenario Typical Size:** 325.00

**Scenario Total Cost:** $67,957.61

**Scenario Cost/Unit:** $209.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 4 | $855.36 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 11 | $4,529.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 6 | $3,241.80 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4 | $10.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 8 | $249.20 |
| Composter, drum, 12 CY | 1627 | 12 CY drum composter unit. Total capacity range is 10-19 CY. Includes equipment, operation controls, and shipping. Labor not included. | Each | $58,932.33 | 1 | $58,932.33 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #5 - Invessel Rotary Drum=>700 CF

**Scenario Description:**

A horizontal rotary drum is installed to compost large poultry and swine facility mortality. The facility can handle between 600 and 1000 lbs per day of mortality, plus equal or higher volumes of carbon material (i.e. wood chips). A secondary composting storage area is required to finish materials. The payment quantity is based on the interior volume of the rotary composter in cubic feet of the smallest drum that can process the daily mortality as per manufacturer's recommendations. This practice addresses resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are also addressed. Associated Practices: Access Road (560), Critical Area Planting (342), Diversion (362), Fence (382), Nutrient Management (590), Roofs and Covers (367), Structure for Water Control (587), Subsurface Drain (606), Underground Outlet (620), and Waste Storage Facility (313).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

A 5' diameter, 54' long rotary drum is installed on two concrete pads that can process 810 lbs of mortality per day. Drum rotation moves and mixes mortality and wood chips. Site preparation includes topsoil removal, gravel sub-base, and concrete pads and slab at two locations plus small floor and walls to complete composting. Input material reduced by 40-60 percent and put into 4' high, three sided, 30'x 30' concrete bin with 10'x30 concrete pad for secondary composting. Area can be protected by adding Roofs and Covers (367 ) standard. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Volume of Drum

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 1,079.00

**Scenario Total Cost:** $86,365.62

**Scenario Cost/Unit:** $80.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 6 | $1,283.04 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 21 | $8,647.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 9 | $4,862.70 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4 | $10.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1 | $31.15 |
| Composter, drum, 28 CY | 1628 | 28 CY drum composter unit. Total capacity range is 20-29 CY. Includes equipment, operation controls, and shipping. Labor not included. | Each | $70,888.87 | 1 | $70,888.87 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #6 - Static pile, Earthen pad

**Scenario Description:**

An impervious earthen pad is installed to compost large animal mortalities (dairy cow) in a static windrow and single pile. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. Piles are turned at least once to achieve another heat cycle prior to land application. Access is infrequent. Vegetation is required for runoff treatment. Resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported to surface and ground water resources are addressed. Air quality impacts related to odors are reduced. Associated Practices: Access Road (560), Composting Facility (317), Critical Area Planting (342), Fence (382), Heavy Use Area Protection (561), Nutrient Management (590), Diversion (362), Roofs and Covers (367), Structure for Water Control (378), Subsurface Drain (606), Underground Outlet (620), and Vegetative Treatment Area (635).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

A compacted earthen surface 50’ x 50’ is constructed. The site can handle mortality for a 100 cow dairy with heifers and calves. On site soils can be re-compacted to meet required imperviousness. Sufficient area for processing equipment access is included. The site is located out of drainage areas. Off-site water is diverted and any runoff is spread out into a grassed area or vegetated treatment area. Site preparation includes removal of top 1’ and re-compacted. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Pad Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $2,021.38

**Scenario Cost/Unit:** $0.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 150 | $384.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 150 | $631.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #7 - Static Pile, Gravel Pad

**Scenario Description:**

A gravel pad installed on a large dairy (1,000 cows plus heifers) or beef operation with an average daily mortality of 175 lbs/day. The area is sized to compost animal mortality as a static pile or windrow with equipment around materials. Sufficient carbon based bulking material is added to allow natural aeration and a proper C:N ratio. The piles are turned at least once to achieve another heat cycle prior to final disposal (land application). The site is located out of drainage areas. Off-site water is diverted and any runoff spread to a grassed area or vegetated treatment area as per regulations. Resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported to surface and ground water resources are addressed. Air quality impacts related to odors are reduced. Associated Practices: Access Road (560), Composting Facility (317), Critical Area Planting (342), Fence (382), Heavy Use Area Protection (561), Nutrient Management (590), Roofs and Covers (367), Structure for Water Control (378), Subsurface Drain (606), Underground Outlet (620), and Vegetative Treatment Area (635).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

A 60’ x 95’ gravel surface is constructed to process animal mortality. 8” thick compacted gravel is installed. The typical layout is 18’ wide piles with an 8’ wide access area around each pile or windrow. Site preparation includes topsoil removal, minimal regrading and compaction, installing geotextile and then gravel. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Pad Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,700.00

**Scenario Total Cost:** $7,213.54

**Scenario Cost/Unit:** $1.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 633 | $898.86 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 140 | $358.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 140 | $589.40 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 140 | $4,361.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #8 - Static pile, Concrete Pad

**Scenario Description:**

A concrete pad is installed over permeable soils, karst topography, frequently accessed sites, or sites with regulatory requirements to compost large animal mortalities (1000 cows plus heifers) or beef animal mortality with an average daily mortality of 175 lbs per day. The area is sized to compost animal mortality as a static pile or windrow with equipment around materials. Sufficient carbon based bulking material is added to allow natural aeration and a proper C:N ratio. The piles are typically turned at least once to achieve another heat cycle prior to final disposal (land application). The site is located out of drainage areas. Off-site water is diverted and any runoff spread onto a grassed area or vegetated treatment area as per regulations. Resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported to surface and ground water resources are addressed. Air quality impacts related to odors are reduced.
Associated Practices: Access Road (560), Composting Facility (317), Critical Area Planting (342), Fence (382), Heavy Use Area Protection (561), Nutrient Management (590), Roofs and Covers (367), Structure for Water Control (378), Subsurface Drain (606), Underground Outlet (620), and Vegetative Treatment Area (635).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

A 60’ x 95’ concrete surface is constructed to process animal mortality. The concrete is installed 6” thick with light reinforcement on 6” of gravel. The typical layout is 18’ wide piles with an 8’ wide access area around each pile or windrow. Site preparation includes topsoil removal, minimal regrading and compaction, installing gravel or sand subbase and then concrete. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Pad Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,700.00

**Scenario Total Cost:** $48,744.46

**Scenario Cost/Unit:** $8.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 105.5 | $43,444.90 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 220 | $563.20 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 105.5 | $444.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 105.5 | $3,286.33 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #9 - Static Pile, Concrete with curbs

**Scenario Description:**

A concrete pad with curb is installed over permeable soils, karst topography, frequently accessed sites, or sites with regulatory requirements to compost large animal mortalities (1000 cows plus heifers) or beef animal mortality with an average daily mortality of 175 lbs per day. Concrete curbs are required to keep material and liquid from entering nearby streams and waterways. The area is sized to compost animal mortality as a static pile or windrow with equipment around materials. Sufficient carbon based bulking material is added to allow natural aeration and a proper C:N ratio. The piles are typically turned at least once to achieve another heat cycle prior to final disposal (land application). The site is located out of drainage areas. Off-site water is diverted and any runoff spread onto a grassed area or vegetated treatment area as per regulations. Resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported to surface and ground water resources are addressed. Air quality impacts related to odors are reduced. Associated Practices: Access Road (560), Composting Facility (317), Critical Area Planting (342), Fence (382), Heavy Use Area Protection (561), Nutrient Management (590), Roofs and Covers (367), Structure for Water Control (378), Subsurface Drain (606), Underground Outlet (620), and Vegetative Treatment Area (635).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

A 60’ x 95’ concrete surface is constructed to process animal mortality. The concrete is installed 6” thick with light reinforcement and 8” x 12” curbs on 6” of gravel. The typical layout is 18’ wide piles with an 8’ wide access area around each pile or windrow. Site preparation includes topsoil removal, minimal regrading and compaction, installing gravel or sand subbase and then concrete. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors, and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Pad area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,700.00

**Scenario Total Cost:** $51,483.32

**Scenario Cost/Unit:** $9.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 105.5 | $43,444.90 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 6 | $3,241.80 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 220 | $563.20 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 105.5 | $444.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 105.5 | $3,286.33 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #10 - Static pile, Wood Bins

**Scenario Description:**

A group of small bins along one side and a long narrow bin on the backside of a concrete pad are installed to compost poultry or small swine mortality in static piles. Sufficient bulking material is added to allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. The roofed portion of the facility is addressed with Roofs and Covers (367). Size of facility based on daily mortality and sizing procedures accepted in particular state. Associated Practices: Access Road (560), Critical Area Planting (342), Diversion (362), Heavy Use Area Protection (561), Nutrient Management (590), Roofs and Covers (367), Roof Runoff Structure (558), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

An 18’ x 40’ concrete pad with 4 bins is installed along the front side (5’H x 10’W x 6’L). One 8’ wide by 40’ long secondary bin is installed. The bin wall is installed with 1’ concrete curbing and 4’ of treated lumber. A gravel apron is installed on three sides using Heavy Use Area Protection - 561. The roofed portion is addressed using Roofs and Covers 367. Site preparation includes topsoil removal, installing 4" of gravel, setting posts , installing concrete slab, installing wooden walls and doors. Piles turned to go through a second heat cycle prior to final land application. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors, and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Total Bin Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 720.00

**Scenario Total Cost:** $18,865.76

**Scenario Cost/Unit:** $26.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 19.25 | $7,927.15 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2.5 | $1,350.75 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 38.5 | $98.56 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 19.25 | $599.64 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 880 | $2,103.20 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 448 | $2,051.84 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #11 - Static pile, Concrete Bins

**Scenario Description:**

Two or more concrete bins, open on one end on a concrete pad, are installed to compost large quantities of poultry or mature swine mortality in static piles. Sufficient bulking material is used to allow natural aeration. Piles are turned to achieve a second heat cycle prior to land application. The roofed portion of the facility is addressed in Cover and Roofs (367). Size of facility based on daily mortality and sizing procedures. Associated Practices: Access Road (560), Critical Area Planting (342), Diversion (362), Heavy Use Area Protection (561), Nutrient Management (590), Roofs and Covers (367), Roof Runoff Structure (558), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

A 20’ deep by 48’ long pad with four bins is installed with 4’ high walls and one end open. Due to heavy traffic during the loading and movement from bin to bin, the open side requires a concrete apron, which is done under Heavy Use Area Protection 561. The roofed portion is addressed using Roofs and Covers (367). Site preparation includes topsoil removal, installing 6" of gravel, setting posts , installing concrete slab,and installing 4' high concrete walls. Piles are turned by moving to adjacent bin to go through a second heat cycle prior to final land application. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors, and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Total Bin Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 960.00

**Scenario Total Cost:** $16,672.70

**Scenario Cost/Unit:** $17.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 18 | $7,412.40 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 15 | $8,104.50 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 36 | $92.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 18 | $560.70 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #12 - Freezer

**Scenario Description:**

A manufactured freezer is installed to hold animal mortality. The payment is made per unit. This option is used to manage extremely environmentally sensitive situations and manage mortalities before they can be removed from the farm and handled according to state regulations. Resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported to surface and ground water resources are addressed. Air quality impacts related to odors are reduced. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

**Before Situation:**

An agricultural operation currently deals with animal mortality in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. The improper management of the operation results in odors and spread pathogens from incomplete composting, incineration, or interaction with predators. No plan is in place for both normal and catastrophic mortality events.

**After Situation:**

Animal mortalities are held in a location free from predators before they can be removed to an off-site rendering facility. Mortalities are carried off-site and disposed of according to state regulations. The concrete slab the freezer is set on is included. An animal mortality plan is formulated for normal and catastrophic mortality events to prevent non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper management results in little to no odors, and protection from predators to minimize pathogen survival and spreading. The selected method for carcass treatment and disposal meets or is permitted by federal, stale, and local laws, rules, and regulations.

**Feature Measure:** Freezer

**Scenario Unit:** Each

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $42,541.02

**Scenario Cost/Unit:** $8,508.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 5 | $2,059.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 4 | $231.40 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| **Materials** | | | | | | |
| Freezer, animal mortality, small | 2052 | Freezer to hold animal mortalities until rendering services become available or until treated by other processes. Capacity < 75 cubic feet. Includes labor and equipment. | Each | $7,989.08 | 5 | $39,945.40 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #58 - Forced Air Composting with mortality preprocessing – poultry/turkey Unit

**Scenario Description:**

This scenario consists of installing a manufactured Forced Air Composting with mortality preprocessing – poultry/turkey Unit designed to handle up to 1200 lbs of average daily poultry/turkey mortality. The unit consist of a concrete slab with cut in forced aeration tubes, a mortality shredding/grinding machine, area for storage of 2nd stage compost and composting material, interior concrete wall to aid in handling the compost, and a roof over the entire system. The unit will be certified by a PE to meet state requirements. After determining average daily mortality in lbs, select the size unit needed from manufacturer supplied sizing table to determine square footage of facility needed. Payment made per unit square footage size obtained from manufacturers' product literature. This option is considered advanced mortality treatment and will require a smaller building footprint (75-50% less) than a roofed static compost pile with concrete floor and bins. Forced aeration compost facilities will also typically have reduced odor and process mortality in less time that static bin composting. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

**Before Situation:**

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:**

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation.

**Feature Measure:** Sq Feet of roof covered facility

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,970.00

**Scenario Total Cost:** $220,884.30

**Scenario Cost/Unit:** $74.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Forced Air Composting with Mortality Preprocessing - Poultry/turkey Unit | 2771 | This force air with mortality preprocessing unit includes a preprocessing mortality shredder grinder capable of processing poultry carcasses, a roof over the composting area, and a concrete pad with forced air bins and secondary storage area. The facility can treat from 600 to 1600 lbs mortality daily with the square foot size of the facility dependent on the lbs of mortality and the number of days required secondary storage (see the sizing table). | Square Feet | $79.17 | 2790 | $220,884.30 |

**Practice:** 316 - Animal Mortality Facility

**Scenario** #65 - Forced Air Composting with mortality preprocessing Unit for Sow-Finisher Animal Size

**Scenario Description:**

This scenario consists of installing a manufactured Forced Air Composting with mortality preprocessing Unit for sow/hog finisher sized animal designed to handle up to 900 lbs of average daily sow/finisher mortality. The unit consist of a concrete slab with cut in forced aeration tubes, a mortality shredding/grinding machine capable of handling larger animals, area for storage of 2nd stage compost and composting material, interior concrete wall to aid in handling the compost, and a roof over the entire system. The unit will be certified by a PE to meet state requirements. After determining average daily mortality in lbs, select the size unit needed from manufacturer supplied sizing table to determine square footage of facility needed. This typical design assumed 90 days of storage needed. Payment made per unit square footage size obtained from manufacturers' product literature. This option is considered advanced mortality treatment and will requires a smaller building footprint (75-50% less) than a roofed static compost pile with concrete floor and bins. Forced aeration compost facilities will also typically have reduced odor and process mortality in less time than static bin composting. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

**Before Situation:**

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

**After Situation:**

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation.

**Feature Measure:** Square Feet of roof covered forced

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,510.00

**Scenario Total Cost:** $278,623.80

**Scenario Cost/Unit:** $79.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Forced Air Composting with Mortality Preprocessing - Sow/finisher Unit | 2772 | This Sow/Finisher force air with mortality preprocessing unit includes a preprocessing mortality shredder grinder capable of processing hog carcasses, a roof over the composting area, and a concrete pad with forced air bins and secondary storage area. The facility can treat from 300 to 1000 lbs mortality daily with the square foot size of the facility dependent on the lbs of mortality and the number of days required secondary storage (see the sizing table). | Square Feet | $79.38 | 3510 | $278,623.80 |

**Practice:** 317 - Composting Facility

**Scenario** #1 - Bins, wood or concrete walls on concrete slab

**Scenario Description:**

Concrete under bins are installed to address water quality concerns and disease vectors resulting from improper waste disposal. The dedicated facility will be used to store and treat by creating a compost product that can be used for land application and enrichment of crop ground. All animal mortality composting will use the Practice Standard 316 – Animal Mortality
Facility.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure, litter and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. The typical composter is designed to handle organic material from a 4 house poultry operation containing 20,000 4 lbs birds in each house. The facility will be installed on a 12' X 32' concrete pad with 4 primary bins (6' (L) x 8' (W) x 5' (H)) and one long secondary bin (6' x 32' x5') on the back side of the primary bins. Typical bin wall consists of 1' concrete curb and 4' of treated lumber. Site preparation includes topsoil removal (0.5'), installing 4" of gravel, setting posts, installing conrete slab (5") and curbing and installing wooden walls.

**Feature Measure:** Total Bin Capacity

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 576.00

**Scenario Total Cost:** $13,031.52

**Scenario Cost/Unit:** $22.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 2 | $427.68 |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 9 | $3,706.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1.5 | $810.45 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 10.7 | $27.39 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 4 | $231.40 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 4 | $38.44 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 7 | $218.05 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 992 | $2,370.88 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 384 | $1,758.72 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 317 - Composting Facility

**Scenario** #2 - Composter, Windrow, compacted earth floor

**Scenario Description:**

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil, and climate conditions are appropriate for earth floors and are allowed by state and local regulations. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality
Facility.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of removing and compacting back into place the top 1' of soil to create a compacted, impervious earthen floor to act as a working area to compost organic material in a static pile, windrow, that has sufficient carbon based bulking material to allow natural aeration. Piles typically turned at least once to go into another heat cycle prior to final deposal, typically land application. Typical pad 90' x 363' (3/4 acre) on an improved compacted earthen surface. Include sufficient area for processing equipment access. Single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes removal and re-compaction of top 1' of material.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 32,670.00

**Scenario Total Cost:** $11,215.80

**Scenario Cost/Unit:** $0.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1210 | $5,094.10 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 1210 | $4,658.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 317 - Composting Facility

**Scenario** #3 - Composter, Windrow, gravel surface

**Scenario Description:**

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, but does not require a hard woirking surface such as concrete. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality
Facility.

Potential

Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing a gravel pad over impervious soil to act as a working area to compost organic material in a static pile, windrow, that has sufficient carbon based bulking material to allow natural aeration. Piles typically turned at least once to go into another heat cycle prior to final deposal, typically land application. Typical pad 90' x 363' (3/4 acre) on an improved gravel surface. Sub base material sufficiently compacted or improved. Include sufficient area for processing equipment access. Single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal (0.5'), excavation and re-compaction of subsoil (1'), placement of geosynthetic material, and installing 6" of compacted gravel.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 32,670.00

**Scenario Total Cost:** $37,052.38

**Scenario Cost/Unit:** $1.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 3630 | $5,154.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1210 | $5,094.10 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 1815 | $6,987.75 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 605 | $18,845.75 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 317 - Composting Facility

**Scenario** #4 - Composter, Windrow, concrete pads, curbs

**Scenario Description:**

The composting facility is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, and requires a hard working surface such as concrete. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality
Facility.

Potential

Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing 6 inches concrete pad with curbs (8" x 12") over compacted gravel to act as a working area to compost organic material in a static pile, windrow, that has sufficient carbon based bulking material to allow natural aeration. Typical reinforced concrete pad is 90' x 263' or 32,670 square feet. Piles typically turned at least once to go into another heat cycle prior to final deposal, typically land application. Sub base consists of compacted gravel. Include sufficient area for processing equipment access. Single piles or windrows to minimize runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal (0.5'), placemnt of compacted gravel (4"), and installing 6" of reinforced concrete.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 32,670.00

**Scenario Total Cost:** $286,715.01

**Scenario Cost/Unit:** $8.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 605 | $249,139.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 20 | $10,806.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 605 | $2,547.05 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 1210 | $4,658.50 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 605 | $18,845.75 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 317 - Composting Facility

**Scenario** #30 - Small Farm Pad + Bins

**Scenario Description:**

The composting facility is installed on a small, urban or organic farm to address water quality concerns, pest/rodent concerns, and disease vectors resulting from improper vegetative waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. The typical facility size is 6 feet by 9 feet and is comprised of a two bin system. Screening is provided to limit access by vermin. Cost may be higher per unit than traditional compost facilities due to construction access limitations.

Potential Associated Practices: Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Livestock Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635), Stormwater Runoff Control (570).

**Before Situation:**

Manure and other vegetative waste are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters.

**After Situation:**

Manure and other agricultural by-products are being controlled by collection at the source and properly stored at an environmentally suitable location, until such time that they are utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing a composting structure on a concrete pad. Concrete pad is 6'x9' on a compacted gravel surface. Include sufficient area for accessing compost structure. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal, compaction of subsoil, and installing a geotextile plus compacted gravel, concrete pad, and composting structure.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 54.00

**Scenario Total Cost:** $4,479.77

**Scenario Cost/Unit:** $82.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 6 | $8.52 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 2 | $12.82 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 30 | $1,534.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 15 | $802.65 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 2 | $62.30 |
| Concrete mix, bag | 1226 | Pre-mixed dry concrete mix in 60 pound bag. Materials only. | Each | $4.95 | 42 | $207.90 |
| Lumber, planks, posts and timbers, untreated, rot resistant | 1612 | Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.59 | 264 | $1,211.76 |

**Practice:** 317 - Composting Facility

**Scenario** #38 - Small Farm Bins, no pad

**Scenario Description:**

The composting facility is installed on a small, urban or organic farm to address water quality concerns, pest/rodent concerns, and disease vectors resulting from improper vegetative waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. The typical facility size is 6 feet by 9 feet and is comprised of a two bin system. Cost may be higher per unit than traditional compost facilities due to construction access
limitations.

Potential Associated Practices: Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Livestock Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635), Stormwater Runoff Control (570).

**Before Situation:**

Manure and other vegetative waste are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters.

**After Situation:**

Manure and other agricultural by-products are being controlled by collection at the source and properly stored at an environmentally suitable location, until such time that they are utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing a composting structure with sufficient area for access. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 54.00

**Scenario Total Cost:** $3,151.32

**Scenario Cost/Unit:** $58.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 20 | $1,023.20 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |
| **Materials** | | | | | | |
| Lumber, planks, posts and timbers, untreated, rot resistant | 1612 | Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.59 | 264 | $1,211.76 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario** #1 - Earthen Containment

**Scenario Description:**

An earthen containment wall with a flexible membrane liner is installed around an existing storage tank to address water quality degradation due to excessive release of organics into ground and surface waters, or excessive sediment and turbidity in surface waters. This facility does not have a roof. Associated practices: Heavy Use Area Protection (561).

**Before Situation:**

An agricultural operation has a single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has an SPCC plan that was developed in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

**After Situation:**

A flexible membrane liner is installed around a 10,000 gallon tank. The containment volume is desgiend for 125% of the tank volume (10,000 gallons x 125%= 12,500 gallons). The bottom dimensions of the containment facility are 40ft x 24ft. The wall is 2.5ft high with a 2ft top width and 2:1 side slopes. The total volume of earthfill is 114 cubic yards. The flexible liner size is 1,872 square feet. The tank(s) will be moved or raised to install the base materials. Hauled in earthfill will be used to construct the dike. The flexible liner will be installed in conformance with the design and specifications. The complete structure provides an environmentally safe facility for storage and handling of oil products stored on the property. Any accidental spills will be contained protecting water quality.

**Feature Measure:** Cubic Yard of compacted earthen

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 114.00

**Scenario Total Cost:** $18,037.04

**Scenario Cost/Unit:** $158.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 126 | $530.46 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 114 | $413.82 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $272.05 | 2 | $544.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 18 | $560.70 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 50 | $112.50 |
| Geotextile, non-woven, heavy weight | 1210 | Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $1.11 | 208 | $230.88 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 1872 | $13,646.88 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $716.69 | 1 | $716.69 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario** #2 - Concrete Containment Wall

**Scenario Description:**

A reinforced concrete containment wall with a concrete slap is installed around an existing storage tank to address water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. Structure will provide an environmentally safe facility for handling and storage of these products. Associated practices may include: Heavy Use Area Protection (561).

**Before Situation:**

An agricultural operation has an existing single wall fuel/oil storage tank(s) without any spill prevention protection. The producer has an SPCC plan that was developed in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

**After Situation:**

A 4,700 gallon tank is contained within the new structure. The containment volume is designed for 125% of the tank volume (4,700 gallons X 125% = 5,875 gallons). The structure will provide an environmentally safe facility for handling and storage of these products. Typical containment dimensions are 196 sqft bottom x 6" thick slab with 6" thick x 4' tall formed sidewalls. Tanks will be moved or raised to install base materials. The fabricated containment structure will be installed in conformance with the design and specifications. The on-farm oil products stored on the farm have secondary containment of accidental release that controls the excessive release of organics, suspended sediments, and turbidity.

**Feature Measure:** Volume of concrete in the wall

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $6,604.58

**Scenario Cost/Unit:** $1,651.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 4.2 | $1,729.56 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 4.3 | $2,323.29 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $272.05 | 2 | $544.10 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 4.2 | $130.83 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 30 | $67.50 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $716.69 | 1 | $716.69 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario** #3 - Single Wall Tank Replacement With A Double Wall Tank or Dike Tank

**Scenario Description:**

An existing single wall, fuel storage tank is replaced with a new double wall tank to address resource concerns related to water quality due to the excessive release of organics into the ground and surface waters, or excessive sediment and turbidity in surface waters. Local or state regulations require the use of double wall tanks or on-farm space limitations preclude the use of an open secondary containment facility. Associated practices: Heavy Use Area Protection (561).

**Before Situation:**

An agricultural operation has an existing single wall fuel/oil storage tank(s) without any spill prevention protection. The producer has an SPCC plan that was developed in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products. The tank is very old, in disrepair and is leaking. There are space limitations on the operation which preclude the installation of an open secondary containment system.

**After Situation:**

An existing single wall, fuel storage tank is replaced with a new double wall tank as per the SPCC plan. Installation is based on a new tank and a “used” double wall tank does not meet the requirements. A 1000 gallon antiroll tank (U/L 142-23 Secondary Containment Vessel) double walled tank that meets EPA regulations is installed. The double wall tank provides an environmentally safe facility for storage and handling of oil products stored on the property. Any accidental spills will be contained protecting water quality.

**Feature Measure:** Tank volume

**Scenario Unit:** Gallons

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $7,155.65

**Scenario Cost/Unit:** $7.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $272.05 | 1 | $272.05 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 1 | $49.81 |
| **Materials** | | | | | | |
| Tank, storage tank, double wall, 4000 gallon, horizontal, steel, above ground | 1733 | Double wall horizontal steel storage tank. Includes cradles, coating, fittings, labor, equipment. Excludes foundations, pumps or piping. | Gallons | $6.48 | 1000 | $6,480.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario** #14 - Corrugated Metal Wall Containment

**Scenario Description:**

This practice scenario includes the installation of a corrugated metal ring containment with a flexible membrane liner around an existing storage tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Associated practices: Heavy Use Area Protection (561)

**Before Situation:**

The agricultural operation has a single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

**After Situation:**

This scenario is based on containment for a 10,000 gallon tank. The containment will be lined with a flexible membrane liner. The containment volume is designed for 125% of the tank volume (10,000 gallons X 125% = 12,500 gallons). The bottom dimensions of the containment are 26 ft x 24 ft. The corrugated panel wall is 2.75 feet high. The total area of wall = 275 SF. The flexible liner size = 930 SF. Tanks will be moved or raised to install base materials. The corrugated wall and flexible liner will be installed in conformance with the design and specifications. The completed structure will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

**Feature Measure:** Square Ft of Corrugated Metal Wall

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 275.00

**Scenario Total Cost:** $7,114.74

**Scenario Cost/Unit:** $25.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 1.5 | $320.76 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 35 | $147.35 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 2 | $250.22 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $272.05 | 2 | $544.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 96 | $3,093.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 12 | $373.80 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 40 | $90.00 |
| Deactivated. Fuel Containment Facility, corrugated metal panel wall with membrane liner, variable cost portion | 1732 | Variable cost portion of a secondary fuel containment facility including metal panels, support posts and flexible liner. Materials only. | Square Feet | $0.00 | 275 | $0.00 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $716.69 | 1 | $716.69 |
| Deactivated. Fuel Containment Facility, corrugated metal panel wall with membrane liner, fixed cost portion | 2061 | Fixed cost portion of a secondary fuel containment facility including metal panels, support posts and flexible liner. This portion is the base cost for the system. Materials only. | Each | $0.00 | 1 | $0.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario** #15 - Modular Block Containment Wall

**Scenario Description:**

This practice scenario includes the installation of a modular block concrete wall containment with a flexible membrane liner over a 6" concrete floor. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. Structure will provide an environmentally safe facility for handling and storage of these products. Associated practices may include: Heavy Use Area Protection (561),

**Before Situation:**

Existing agricultural operation that has single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, that requires an above ground secondary containment facility for on-farm oil products.

**After Situation:**

This scenario is based on containment for a 6,000 gallon tank. The containment volume is designed for 125% of the tank volume (6,000 gallons X 125% = 7,500 gallons). Structure will provide an environmentally safe facility for handling and storage of these products. The bottom dimensions of the containment are 26ft x 24ft. The 2ft x 2ft x 6ft modular blocks are stacked 2 high for a wall height of 4ft. The containment area is 624 sq.ft. The flexible liner size with a 2ft overlap and achored at the top of the modular block is 1224 sf. Tanks will be moved or raised to install base materials. The fabricated containment structure will be installed in conformance with the design and specifications. The on-farm oil products stored on the farm have secondary containment of accidental release that controls the excessive release of organics, suspended sediments, and turbidity. Structure will provide an environmentally safe facility for handling and storage of these products.

**Feature Measure:** secondary containment area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 624.00

**Scenario Total Cost:** $22,895.12

**Scenario Cost/Unit:** $36.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 16 | $6,588.80 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 13 | $83.33 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $272.05 | 2 | $544.10 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 13 | $394.68 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 12 | $373.80 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 30 | $67.50 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 1224 | $8,922.96 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yards | $121.17 | 36 | $4,362.12 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $716.69 | 1 | $716.69 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 324 - Deep Tillage

**Scenario** #1 - Deep Tillage less than 20 inches

**Scenario Description:**

Fields (80 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the restrictive soil layer.

**Before Situation:**

In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 80 acres with crop rotations consisting of annual row crops or small grains with conventional tillage or when the harvesting of row crops (onions, sugar beets, potato, and corn silage) use heavy trucks to assist with the harvest. Compaction has been caused when soil moisture is too wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is weak and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

**After Situation:**

Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths less than 20 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally performed in the fall after crop harvest when soil conditions are dry. After deep tillage, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracks beneath tractors or grain wagons can help spread the weight load.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $2,278.50

**Scenario Cost/Unit:** $28.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Ripper or subsoiler, 16 to 36 inch depth | 1235 | Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor. | Acres | $24.06 | 80 | $1,924.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |

**Practice:** 324 - Deep Tillage

**Scenario** #2 - Deep Tillage more than 20 inches

**Scenario Description:**

Fields (80 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the restrictive soil layer.

**Before Situation:**

In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 80 acres with crop rotations consisting of annual row crops, orchard /vineyards or small grains with conventional tillage or when the harvesting of row crops (onions, sugar beets, potato, and corn silage) use heavy trucks to assist with the harvest. Orchards and vineyards may be deep ripped prior to establishment of perennial crop. Compaction has been caused when soil moisture is too wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is weak and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

**After Situation:**

Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths more than 20 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally performed in the fall after crop harvest when soil conditions are dry. When possible, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracks beneath tractors or grain wagons can help spread the weight load.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $5,321.70

**Scenario Cost/Unit:** $66.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Ripper or subsoiler, > 36 inch depth | 1236 | Deep ripper or subsoiler, (>36 inches depth) includes tillage implement, power unit and labor. | Acres | $62.10 | 80 | $4,968.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |

**Practice:** 324 - Deep Tillage

**Scenario** #17 - Deep Tillage, Off Site Equipment

**Scenario Description:**

Fields (10 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the compacted zone below the restrictive soil layer.

**Before Situation:**

In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 10 acres with crop rotations consisting of annual row crops or small grains with conventional tillage or when the harvesting of row crops (onions, sugar beets, potato, corn silage) use heavy trucks to assist with the harvest. Compaction has been caused when soil moisture is to wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is week and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

**After Situation:**

Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation. Equipment is rented and moved from off site. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally preformed in the fall after crop harvest when soil conditions are dry. When possible, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracts beneath tractors or grain wagons can help spread the weight load.

**Feature Measure:** Unknown

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $845.77

**Scenario Cost/Unit:** $84.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Ripper or subsoiler, 16 to 36 inch depth | 1235 | Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor. | Acres | $24.06 | 10 | $240.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 325 - High Tunnel System

**Scenario** #33 - High Tunnel, Low Snow and Wind Load

**Scenario Description:**

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

**Before Situation:**

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

**After Situation:**

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

**Feature Measure:** Area of Tunnel Installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,160.00

**Scenario Total Cost:** $12,165.78

**Scenario Cost/Unit:** $5.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 71 | $2,287.62 |
| **Materials** | | | | | | |
| High Tunnel, Quonset Style, Fixed Cost | 2789 | Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Number | $2,274.96 | 1 | $2,274.96 |
| High Tunnel, Quonset style, Variable Cost | 2790 | Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Square Feet | $3.52 | 2160 | $7,603.20 |

**Practice:** 325 - High Tunnel System

**Scenario** #68 - Small High Tunnel, Low Snow and Wind

**Scenario Description:**

Use in areas with low expected snow and wind loads on sites less than 1 acre. Quonset-style (round) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

**Before Situation:**

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

**After Situation:**

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

**Feature Measure:** Area of High Tunnel Installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $6,223.50

**Scenario Cost/Unit:** $10.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 57 | $1,836.54 |
| **Materials** | | | | | | |
| High Tunnel, Quonset Style, Fixed Cost | 2789 | Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Number | $2,274.96 | 1 | $2,274.96 |
| High Tunnel, Quonset style, Variable Cost | 2790 | Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Square Feet | $3.52 | 600 | $2,112.00 |

**Practice:** 325 - High Tunnel System

**Scenario** #69 - Small High Tunnel, Snow and Wind

**Scenario Description:**

Use in areas with expected snow and wind loads on sites less than 1 acre. Gothic-style (arched) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

**Before Situation:**

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

**After Situation:**

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

**Feature Measure:** Area of High Tunnel Installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $8,778.02

**Scenario Cost/Unit:** $14.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 57 | $1,836.54 |
| **Materials** | | | | | | |
| High Tunnel, Gothic Style, Fixed Cost | 2791 | Fixed cost portion of a gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials and shipping only. | Number | $2,799.08 | 1 | $2,799.08 |
| High Tunnel, Gothic Style, Variable Cost | 2792 | Variable cost portion of a Gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Includes materials and shipping only. | Square Feet | $4.11 | 600 | $2,466.00 |
| High Tunnel, End Walls | 2799 | Includes frame, polyvinyl covering, and appurtenances. Price is for two end walls based on the width of the structure. Manufactured doors not included. Includes material and shipping only. | Feet | $60.72 | 20 | $1,214.40 |
| High Tunnel, Truss Supports | 2800 | Rafter or truss support system on Seasonal High Tunnels to add strength for wind or snow load. Based on the area of the structure (square feet). Includes materials and shipping only. | Square Feet | $0.77 | 600 | $462.00 |

**Practice:** 325 - High Tunnel System

**Scenario** #96 - Contiguous US Snow

**Scenario Description:**

Used for contiguous US states in areas with high snowfall. A gothic style (peaked) manufactured frame of tubular steel (30 x 70 ft.) with end walls and/or truss supports covered with 4-year 6 mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications.

**Before Situation:**

Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include soil erosion, soil condition, water quality, water quantity, and plant condition.

**After Situation:**

A high tunnel structure has been installed and he growing season has been extended for 1-4 months on average. Plant health and vigor has been improved.

**Feature Measure:** Area of Tunnel Installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,160.00

**Scenario Total Cost:** $17,949.10

**Scenario Cost/Unit:** $8.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 71 | $2,287.62 |
| **Materials** | | | | | | |
| High Tunnel, Gothic Style, Fixed Cost | 2791 | Fixed cost portion of a gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials and shipping only. | Number | $2,799.08 | 1 | $2,799.08 |
| High Tunnel, Gothic Style, Variable Cost | 2792 | Variable cost portion of a Gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Includes materials and shipping only. | Square Feet | $4.11 | 2160 | $8,877.60 |
| High Tunnel, End Walls | 2799 | Includes frame, polyvinyl covering, and appurtenances. Price is for two end walls based on the width of the structure. Manufactured doors not included. Includes material and shipping only. | Feet | $60.72 | 30 | $1,821.60 |
| High Tunnel, Truss Supports | 2800 | Rafter or truss support system on Seasonal High Tunnels to add strength for wind or snow load. Based on the area of the structure (square feet). Includes materials and shipping only. | Square Feet | $0.77 | 2160 | $1,663.20 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 500 | $500.00 |

**Practice:** 325 - High Tunnel System

**Scenario** #112 - Small Gothic HT with Gutter

**Scenario Description:**

Use in areas with low expected snow and wind loads on sites less than 1 acre. Gothic-style (arched) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Gutter placed on each side to capture and convey runoff away from the tunnel. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

**Before Situation:**

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

**After Situation:**

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved. Gutter system reduces soil erosion and ponding and or conveys water to a catchment for reuse.

**Feature Measure:** Area of High Tunnel Installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $8,082.00

**Scenario Cost/Unit:** $13.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 57 | $1,836.54 |
| **Materials** | | | | | | |
| Gutter, Downspout, PVC, 5 in. | 1388 | 5 inch PVC guttering. Materials only. | Feet | $1.66 | 12 | $19.92 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 21 | $96.18 |
| Gutter, Galvanized Steel, Medium | 1693 | Galvanized Steel gutter, 7 to 9 in. width with hangers. Materials only. | Feet | $13.94 | 62 | $864.28 |
| High Tunnel, Gothic Style, Fixed Cost | 2791 | Fixed cost portion of a gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials and shipping only. | Number | $2,799.08 | 1 | $2,799.08 |
| High Tunnel, Gothic Style, Variable Cost | 2792 | Variable cost portion of a Gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Includes materials and shipping only. | Square Feet | $4.11 | 600 | $2,466.00 |

**Practice:** 325 - High Tunnel System

**Scenario** #120 - High Tunnel Gothic with Gutters

**Scenario Description:**

Gothic-style manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Add on gutters and downspout system to convey water away from high tunnel to prevent flooding, soil erosion or to reuse water. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include Underground Outlet (620), Critical Area Planting (342), Mulching (484).

**Before Situation:**

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

**After Situation:**

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved. Gutters reduce soil erosion from runoff, reduce water flooding into tunnel.

**Feature Measure:** Area of tunnel installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,160.00

**Scenario Total Cost:** $16,561.74

**Scenario Cost/Unit:** $7.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| **Materials** | | | | | | |
| Gutter, Downspout, PVC, 5 in. | 1388 | 5 inch PVC guttering. Materials only. | Feet | $1.66 | 12 | $19.92 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 49 | $224.42 |
| Gutter, Galvanized Steel, Medium | 1693 | Galvanized Steel gutter, 7 to 9 in. width with hangers. Materials only. | Feet | $13.94 | 148 | $2,063.12 |
| High Tunnel, Gothic Style, Fixed Cost | 2791 | Fixed cost portion of a gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials and shipping only. | Number | $2,799.08 | 1 | $2,799.08 |
| High Tunnel, Gothic Style, Variable Cost | 2792 | Variable cost portion of a Gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Includes materials and shipping only. | Square Feet | $4.11 | 2160 | $8,877.60 |

**Practice:** 325 - High Tunnel System

**Scenario** #138 - Small High Tunnel, Intensive Sun

**Scenario Description:**

Use in areas with low expected snow and wind loads on sites less than 1 acre. Quonset-style (round) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

**Before Situation:**

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

**After Situation:**

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

**Feature Measure:** Area of High Tunnel Installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $6,397.50

**Scenario Cost/Unit:** $10.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 57 | $1,836.54 |
| **Materials** | | | | | | |
| High Tunnel, Quonset Style, Fixed Cost | 2789 | Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Number | $2,274.96 | 1 | $2,274.96 |
| High Tunnel, Quonset style, Variable Cost | 2790 | Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Square Feet | $3.52 | 600 | $2,112.00 |
| Shade cloth | 2793 | Knitted or woven, high tensile, UV resistant shade cloth of a minimum of 30% sunlight control. Includes grommets with reinforced edging. Materials and shipping only. | Square Feet | $0.29 | 600 | $174.00 |

**Practice:** 325 - High Tunnel System

**Scenario** #139 - High Tunnel Round with Gutters

**Scenario Description:**

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Gutters and downspout on each side direct water away from high tunnel. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

**Before Situation:**

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

**After Situation:**

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

**Feature Measure:** Area of Tunnel Installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,160.00

**Scenario Total Cost:** $14,412.90

**Scenario Cost/Unit:** $6.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 71 | $2,287.62 |
| **Materials** | | | | | | |
| Gutter, Downspout, PVC, 5 in. | 1388 | 5 inch PVC guttering. Materials only. | Feet | $1.66 | 12 | $19.92 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 48 | $219.84 |
| Gutter, Galvanized Steel, Medium | 1693 | Galvanized Steel gutter, 7 to 9 in. width with hangers. Materials only. | Feet | $13.94 | 144 | $2,007.36 |
| High Tunnel, Quonset Style, Fixed Cost | 2789 | Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Number | $2,274.96 | 1 | $2,274.96 |
| High Tunnel, Quonset style, Variable Cost | 2790 | Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Square Feet | $3.52 | 2160 | $7,603.20 |

**Practice:** 325 - High Tunnel System

**Scenario** #140 - Small Tunnel with Gutter

**Scenario Description:**

Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Runoff is captured in gutters placed on tunnel sides and conveys water away from the high tunnel reducing erosion or to catch and reuse water. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

**Before Situation:**

Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

**After Situation:**

High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved. Gutters convey water to reduce soil erosion, ponding near the high tunnel, and or catchment for water reuse.

**Feature Measure:** Area of High Tunnel Installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $7,208.46

**Scenario Cost/Unit:** $12.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 57 | $1,836.54 |
| **Materials** | | | | | | |
| Gutter, Downspout, PVC, 5 in. | 1388 | 5 inch PVC guttering. Materials only. | Feet | $1.66 | 12 | $19.92 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 22 | $100.76 |
| Gutter, Galvanized Steel, Medium | 1693 | Galvanized Steel gutter, 7 to 9 in. width with hangers. Materials only. | Feet | $13.94 | 62 | $864.28 |
| High Tunnel, Quonset Style, Fixed Cost | 2789 | Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Number | $2,274.96 | 1 | $2,274.96 |
| High Tunnel, Quonset style, Variable Cost | 2790 | Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Square Feet | $3.52 | 600 | $2,112.00 |

**Practice:** 326 - Clearing and Snagging

**Scenario** #8 - Clearing and Snagging - Light

**Scenario Description:**

Removal of vegetation, logs, or other material that impedes the proper functioning on up to 200 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

**Before Situation:**

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-third of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

**After Situation:**

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

**Feature Measure:** Linear Feet

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $3,964.66

**Scenario Cost/Unit:** $19.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 6 | $440.94 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 6 | $750.66 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 12 | $79.80 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 8 | $430.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 24 | $816.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 326 - Clearing and Snagging

**Scenario** #9 - Clearing and Snagging - Medium

**Scenario Description:**

Removal of vegetation, logs, or other material that impedes the proper functioning on 200 to 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

**Before Situation:**

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-half of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

**After Situation:**

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

**Feature Measure:** Linear Feet

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $5,573.50

**Scenario Cost/Unit:** $18.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 10 | $1,009.40 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 10 | $1,251.10 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 20 | $133.00 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 10 | $537.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 32 | $1,088.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 326 - Clearing and Snagging

**Scenario** #10 - Clearing and Snagging - Heavy

**Scenario Description:**

Removal of vegetation, logs, or other material that impedes the proper functioning on over 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

**Before Situation:**

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately two-thirds of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

**After Situation:**

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

**Feature Measure:** Linear Feet

**Scenario Unit:** Feet

**Scenario Typical Size:** 400.00

**Scenario Total Cost:** $8,363.28

**Scenario Cost/Unit:** $20.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 16 | $1,615.04 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 16 | $2,001.76 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 30 | $199.50 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 16 | $860.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 30 | $966.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 40 | $1,360.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 327 - Conservation Cover

**Scenario** #1 - Introduced Species

**Scenario Description:**

The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of dust emissions which improves air quality significantly. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings. Applies to conventional or organic systems.

**Before Situation:**

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceed allowable tolerance, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

**After Situation:**

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of significant dust emissions which improves air quality. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $11,929.50

**Scenario Cost/Unit:** $238.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 150 | $1,981.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 50 | $363.00 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 50 | $1,079.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 50 | $1,113.50 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 2500 | $3,100.00 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 2000 | $2,020.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 50 | $2,272.50 |

**Practice:** 327 - Conservation Cover

**Scenario** #2 - Native Species

**Scenario Description:**

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent native vegetation (scenario includes native grass). The typical size of the practice is 50 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Applies to conventional or organic systems

**Before Situation:**

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceeds allowable tolerance, and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

**After Situation:**

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent native grass vegetation which reduces soil erosion and water/sediment runoff, and eliminates dust emissions which improves air quality. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $11,598.50

**Scenario Cost/Unit:** $231.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 150 | $1,981.50 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 100 | $2,158.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 50 | $1,113.50 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 50 | $6,345.50 |

**Practice:** 327 - Conservation Cover

**Scenario** #3 - Orchard or Vineyard Alleyways

**Scenario Description:**

This practice applies on orchards and vineyards needing permanent protective cover in the alleyways between tree and vine rows. The typical size of this practice is 20 acres. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent vegetation (scenario includes non-native grass and legume mix). This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, enhance wildlife and/or pollinator habitat, manage plant pests, and reduce air quality impacts. Typically 60% of the surface area is conservation cover per acre.

**Before Situation:**

Orchard or vineyard with bare soil between vine/tree rows. Bare soil is exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter sediment/nutrient runoff from orchards/vineyards increases. Soil erosion exceeds tolerable levels. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of long periods of bare soil. Little to no wildlife/pollinator habitat is present.

**After Situation:**

The 327 Implementation Requirements have been developed for the site and has been applied. Orchard or Vineyard area between vine/tree rows are planted with permanent introduced grass/legume mix. Area covered has reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of significant amounts of dust emissions.. Plants sown for conservation cover may provide cover for beneficial insects, pollinators, and wildlife.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $3,246.72

**Scenario Cost/Unit:** $162.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 24 | $317.04 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 12 | $87.12 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 24 | $517.92 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 12 | $267.24 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 600 | $744.00 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 480 | $484.80 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 480 | $283.20 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 12 | $545.40 |

**Practice:** 327 - Conservation Cover

**Scenario** #4 - Pollinator Species

**Scenario Description:**

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on any land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet, rill, and wind erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems.

**Before Situation:**

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

**After Situation:**

The 327 Implementation Requirements have been developed for the site and applied. Land is covered with permanent pollinator habitat including a mix of native grasses, legumes, forbs (mix may also include non-native species). This practice may also have reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $777.27

**Scenario Cost/Unit:** $777.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 3 | $39.63 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 2 | $43.16 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |

**Practice:** 327 - Conservation Cover

**Scenario** #22 - Monarch Species Mix

**Scenario Description:**

Establish permanent vegetative cover for pollinator habitat according to state specifications. Typically used for high quality nectar and pollen species. Assumes seed/plugs, equipment and labor for seed bed prep/planting, and weed management during establishment. Used for conventional or organic land on small, intensive areas that are central to specialty crop production. Not typically used for large-scale plantings. This is applicable to both organic and non-organic conditions.

**Before Situation:**

Old hayfields that are mowed typically in the fall lack milkweed needed for monarchs. Other crops such as corn, soybeans, or cotton are conventionally grown and harvested. The system provides little to no wildlife or pollinator habitat.

**After Situation:**

The 327 Implementation Requirements have been developed and applied for the site. Land covered with permanent monarch habitat including a mix of milkweed species, native grasses, legumes, and forbs. Plants sown for monarch habitat may also provide cover for beneficial insects and wildlife.

**Feature Measure:** area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $954.42

**Scenario Cost/Unit:** $954.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 3 | $39.63 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 2 | $43.16 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1.4 | $620.02 |

**Practice:** 327 - Conservation Cover

**Scenario** #75 - Introduced with Forgone Income

**Scenario Description:**

This practice applies on organically managed land needing permanent protective cover. This practice typically involves conversion from an intensive organic cropping system to permanent non-native vegetation (scenario includes non-native grass/legume mix). The typical size of the practice is 20 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts.

**Before Situation:**

Crops such as vegetables and small fruit crops are organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

**After Situation:**

The 327 Implementation Requirements have been developed for the site and has been applied. Organically managed land covered with permanent non- native grass/legume mix vegetation has reduced soil erosion, reduced water/sediment runoff, and improved air quality due to the elimination of dust emissions. . Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $24,102.50

**Scenario Cost/Unit:** $482.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 150 | $1,981.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 50 | $363.00 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 50 | $1,079.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 50 | $1,113.50 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 25 | $8,901.75 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 25 | $7,656.25 |
| **Materials** | | | | | | |
| Nitrogen, Organic | 266 | ORGANIC Nitrogen | Pound | $0.23 | 2500 | $575.00 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.08 | 2000 | $160.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 50 | $2,272.50 |

**Practice:** 327 - Conservation Cover

**Scenario** #77 - Pollinator Species with Forgone Income

**Scenario Description:**

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems.

**Before Situation:**

Crops such as vegetables and small fruit crops may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

**After Situation:**

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent pollinator habitat including a mix of native grasses, legumes, and forbs (mix may also include non-native species). This practice may also reduce soil erosion, reduce water/sediment runoff, and improve air quality due to the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $879.09

**Scenario Cost/Unit:** $879.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 3 | $39.63 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 2 | $43.16 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.5 | $178.04 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.5 | $153.13 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |

**Practice:** 327 - Conservation Cover

**Scenario** #81 - Native Grasses and Forbs

**Scenario Description:**

Permanment vegetation including native grasses and forbs is established on land needing permanent native vegetative cover. This practice scenario is used to improve plant structure and composition, develop wildlife habitat, and improve carbon sequestration. Applies to conventional or organic systems.

**Before Situation:**

An area of introduced, cool season grasses exhibits inadequate plant structure and composition. Inadequate plant structure and composition adversely impacts nesting and foraging habitat for wildlife. Introduced species do not provide full potential for carbon sequestration due to shallow root systems and C3 plant physiology.

**After Situation:**

The land is covered with permanent native grasses and forbs which provide improved plant structure and composition, better wildlife habitat, and improved carbon sequestration due to deeply rooted native plant species. This scenario does not apply to plantings for forage or biomass production or for critical area plantings.

**Feature Measure:** Area Planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $4,225.35

**Scenario Cost/Unit:** $281.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 45 | $594.45 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 30 | $647.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 15 | $334.05 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Low Density | 2753 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping. | Acres | $176.63 | 15 | $2,649.45 |

**Practice:** 327 - Conservation Cover

**Scenario** #82 - Native Grasses and Forbs, Forgone Income

**Scenario Description:**

This scenario applies on land to be retired from agriculturalproduction and typically involves conversion from a clean-tilled intensive cropping system to permanent native vegetation. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Applies to organic or conventional systems.

**Before Situation:**

Crops such as corn, soybeans, or small grains have been conventionally or organically grown and harvested. Full width tillage is utilized and weeds are controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceeds allowable tolerance, and sediment may be moving offsite into surface water degrading water quality. Soil Quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides minimal wildlife habitat.

**After Situation:**

Implementation requirements for conservation cover have been developed for the site and applied. The land is covered with permanent native grasses and forbs which provide improved plant structure and composition, reduced soil loss, improved soil quality, and better wildlife habitat. Cessation of field operations reduces air borne particulates thereby improving air quality. This scenario does not apply to plantings for forage production or for critical area plantings.

**Feature Measure:** Area Planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $9,192.75

**Scenario Cost/Unit:** $612.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 45 | $594.45 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 30 | $647.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 15 | $334.05 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 7.5 | $2,670.53 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 7.5 | $2,296.88 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Low Density | 2753 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping. | Acres | $176.63 | 15 | $2,649.45 |

**Practice:** 327 - Conservation Cover

**Scenario** #100 - Pollinator Mix-Small Footprint

**Scenario Description:**

Permanent vegetation, including a mix of grasses, legumes and forbs established on any land needing permanent vegetative cover that provides habitat, cover, and food for pollinators. Typical size varies depending on the site feasibility for length and width. Urban sites typical size is 2000 square feet (20x100 ft). This scenario included mechanical site preparation. This practice scenario may also reduce wind and water erosion, improve soil quality, reduce water quality degradation and reduce air emissions of particulate matter or greenhouse gases. Applies to conventional and organic systems. This scenario does not applied to areas needing Critical Area Planting.

**Before Situation:**

Crop rotation include specialty crops such as vegetable and fruit/berry production that benefit from pollinator activity. Urban agricultural sites do not provide for pollinator habitat at this time. Planting operations include mechanical removal of weeds. Land adjacent to the planting beds is not managed for resource concerns.

**After Situation:**

The 327 implementation requirements have been developed for the site and applied. Land is in permanent vegetative cover reducing erosion and sediment delivery to water. Pollinator habitat has successfully established providing habitat and cover for pollinators and beneficial insects.

**Feature Measure:** Area of conservation Cover Installe

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $267.71

**Scenario Cost/Unit:** $133.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 0.5 | $10.79 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 0.5 | $221.44 |

**Practice:** 328 - Conservation Crop Rotation

**Scenario** #1 - Basic Rotation Organic and Non-Organic

**Scenario Description:**

In this region this practice may be part of a conservation management system on both organic and non-organic operations to: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to the producer for the time needed to plan and implement the logistics of changing the rotation to effectively implement a conservation crop rotation on a typical 200 acre cropland farm. No foregone income. Cost represents typical situations for conventional and organic producers.

**Before Situation:**

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

**After Situation:**

A rotation is established that provides additional high residue and/or perennial crops that may treat one or more of the following purposes: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, reduce water quality degradation due to excess nutrients, improve soil moisture efficiency, reduce the concentration of salts and other chemicals from saline seeps, reduce plant pest pressures, provide feed and forage for domestic livestock, or provide food and cover habitat for wildlife, including pollinator forage, and nesting.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,605.30

**Scenario Cost/Unit:** $16.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 30 | $1,605.30 |

**Practice:** 328 - Conservation Crop Rotation

**Scenario** #5 - Specialty Crops Organic and Non-Organic

**Scenario Description:**

In this region a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 50 acre specialty crop farm. No foregone income. Cost represents typical situations for organic and non-organic producers.

**Before Situation:**

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concerns.

**After Situation:**

The rotation established adds higher residue crop(s) to the rotation that will treat one or more of the following resource concerns on organic and non- organic farms: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $2,140.40

**Scenario Cost/Unit:** $42.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |

**Practice:** 328 - Conservation Crop Rotation

**Scenario** #93 - Specialty Crop Rotations-Small Scale

**Scenario Description:**

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

**Before Situation:**

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil.

**After Situation:**

The rotation established adds diversity of plant material organic matter, higher residue amounts that will treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure.

**Feature Measure:** area planned

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $627.73

**Scenario Cost/Unit:** $41.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 0.34 | $7.34 |
| Seeding Operation, No Till/Strip Till Planter | 1230 | No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor. | Acres | $27.52 | 0.34 | $9.36 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 9 | $289.98 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |

**Practice:** 329 - Residue and Tillage Management, No Till

**Scenario** #1 - No-Till/Strip-Till

**Scenario Description:**

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till system on 100 acres of cropland. This involves managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities used to establish and harvest crops. The practice is used to reduce sheet and rill erosion, reduce wind erosion, improve soil quality, reduce CO2 losses from the soil, reduce energy use, increase plant available moisture and provide food and escape cover for wildlife. The no-till/strip-till system includes non-tillage types of weed control and may also include a period of no till fallow. System is applicable in both irrigated and non-irrigated fields of organic and non-organic operations.

**Before Situation:**

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage, seedbed preparation or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible rills by spring. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR).

**After Situation:**

The Implementation Requirements for 329 Residue Management, No Till is prepared and installed. Managing crop residue on the surface of a field (typical 100 acre) year around according to the 329 practice plan while limiting soil disturbing activities to those which place nutrients, and plant crops that meet the minimum criteria in the 329 practice standard. All crops are seeded/planted with a no-till drill or no-till/strip-till planter, which minimizes soil disturbance while establishing good seed-soil contact. All residues are to be maintained on the soil surface in a uniform distribution over the entire field and not burned or removed. Crop residues provide soil surface cover throughout the year. Runoff and erosion are reduced and no rills are visible on the soil surface. Wind erosion is reduced by standing residues and surface cover. Over time, soil health is improved due to the additional biomass (crop residues), ground cover, and soil infiltration. Crop residues and/or cover crop residues left on the soil surface may maximize weed control by increasing allelopathic and mulching effect, and provides cover for wildlife. The practice would require reducing soil disturbance and erosion and increasing biomass returned to the soil in sufficient amounts to achieve increased SCI and decreased STIR.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $2,227.00

**Scenario Cost/Unit:** $22.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 100 | $2,227.00 |

**Practice:** 329 - Residue and Tillage Management, No Till

**Scenario** #3 - No Till Adaptive Management

**Scenario Description:**

The practice scenario is for the implementation of no till in small replicated plots to allow the producer to learn how to manage no till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular no till management strategy (e.g., no till vs conventional till, drill vs planter, strip till vs no till, residue row cleaners, vs no row cleaners, etc.) This will be done by following the Agronomy Technical Note 10 - Adaptive Management.

**Before Situation:**

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion exceeds soil loss tolerances. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR). The producer is considering using no till technology, but is unsure how to manage on their operation or needs to improve the management of no till to be successful.

**After Situation:**

Implementation Requirements are prepared and an Adaptive Management Plan for the plots is developed and implemented. Installation of this scenario will result in establishment of no till replicated plots to compare to different management strategies for no till and other residue management strategies following the guidance in the Agronomy Technical Note 10 - Adaptive Management Process. Implementation involves establishing the replicated plots to evaluate one or more no till management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in no till management. Results are used to make no till management decisions to address erosion, soil health, and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

**Feature Measure:** Based on 15 acre plots

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,307.83

**Scenario Cost/Unit:** $4,307.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 7.5 | $167.03 |
| Seeding Operation, No Till/Strip Till Planter | 1230 | No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor. | Acres | $27.52 | 7.5 | $206.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |

**Practice:** 329 - Residue and Tillage Management, No Till

**Scenario** #30 - Small Scale No Till

**Scenario Description:**

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Improve soil moisture efficiency, 4) Reduce plant pest pressures. This practice payment is provided to effectively implement no-till or strip-till management on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

**Before Situation:**

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil-residue amounts average 10% or less. Full width tillage is performed prior to planting . Weed control typically cultivation.

**After Situation:**

The implementation requirements are written following CPS 329 Residue and Tillage Management to will treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure. Soil disturbance is minimized with no-till drill or planter use. May include single slot opener and seedling or plugs follow. When pest management requires the removal of crop residue then planting beds are covered with cover crop using the 340 Cover Crop conservation practice. Runoff and erosion are reduced below T. No observed rills. Wind erosion reduced by maintaining surface cover. They system meets the soil condition index and STIR requirements.

**Feature Measure:** area planted

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $716.16

**Scenario Cost/Unit:** $47.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.17 | $3.79 |
| Seeding Operation, No Till/Strip Till Planter | 1230 | No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor. | Acres | $27.52 | 0.17 | $4.68 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |

**Practice:** 330 - Contour Farming

**Scenario** #1 - Contour Farming

**Scenario Description:**

This scenario meets the specifications of the NRCS Contour Farming Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in laying out and implementing contour farming. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways

**Before Situation:**

The typical field size in this geographical region for this scenario is 30 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations on this cropland field including disking, bedding, planting, and cultivation are performed generally up and down the slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

**After Situation:**

Implementation Requirements are prepared and implemented according to 330 Contour Farming. This practice is installed on the entire field. A survey is completed by trained and certified Federal, State, local personnel or consultant to determine and "stake" contour row arrangement. Permanent row markers are established to ensure that this practice is maintained for the life of this practice. All field operations including disking, bedding, planting, and cultivation are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operators are properly following contour methods. Soil erosion rates are reduced by nearly half and may be below tolerance depending on the rotation. Likewise, sedimentation has been significantly reduced.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $355.33

**Scenario Cost/Unit:** $11.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |

**Practice:** 331 - Contour Orchard and Other Perennial Crops

**Scenario** #1 - Contour Orchards/Vineyards

**Scenario Description:**

This scenario meets the specifications of the NRCS 331 Contour Orchards and Perennial Crops Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in implementing and following contour operations compared to other methods. More time is usually needed when following contour operations due to more equipment time in shorter rows and more equipment turning. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

**Before Situation:**

The typical field size in this geographical region for this scenario is 10 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations are performed up and down the slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

**After Situation:**

Implementation Requirements are prepared and implemented according to the Contour Orchards and Perennial Crops Standard (331). This practice is installed on the entire field. All field operations including: harvesting, disking, bedding, and planting are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operators are properly following contour methods. Soil erosion rates are reduced to tolerable soil loss levels. Likewise, sedimentation has be significantly reduced.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $355.33

**Scenario Cost/Unit:** $35.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |

**Practice:** 332 - Contour Buffer Strips

**Scenario** #63 - Native Species, Foregone Income (Organic and Non-organic)

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are organically or non-organically farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production.

**Before Situation:**

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

**Feature Measure:** number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $527.98

**Scenario Cost/Unit:** $527.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1 | $356.07 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |

**Practice:** 332 - Contour Buffer Strips

**Scenario** #64 - Introduced Species, Foregone Income (Organic and Non-Organic)

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production. This applies to both organic and non-organic.

**Before Situation:**

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $510.12

**Scenario Cost/Unit:** $510.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1 | $356.07 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 20 | $20.20 |
| Sulfate of Potash | 263 | Approved for Organic Systems - Muriate of Potash | Pound | $0.64 | 20 | $12.80 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 1 | $45.45 |

**Practice:** 332 - Contour Buffer Strips

**Scenario** #65 - Wildlife/Pollinator, Foregone Income (Organic and Non-Organic)

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly pollinator friendly species. The area of the field border is taken out of production. This applies to organic and no-organic.

**Before Situation:**

Water Erosion Calculator (e.g. RUSLE2) indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Plant species will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, producer objectives, and the targeted wildlife/pollinators necessary food and/or cover. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the wildlife/pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control sheet and rill erosion to tolerable levels on the cropped area of the field.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $527.98

**Scenario Cost/Unit:** $527.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1 | $356.07 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |

**Practice:** 332 - Contour Buffer Strips

**Scenario** #66 - Native, Foregone Income-High Value Cropland

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour buffer strips is taken out of production.

**Before Situation:**

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are produced on this acreage. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

**Feature Measure:** number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,677.25

**Scenario Cost/Unit:** $1,677.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Vegetables | 2033 | Vegetables is Primary Crop | Acres | $1,505.34 | 1 | $1,505.34 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |

**Practice:** 332 - Contour Buffer Strips

**Scenario** #67 - Introduced-High Value Cropland

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly introduced species. The area of the field border is taken out of production.

**Before Situation:**

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are grown in this field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,659.39

**Scenario Cost/Unit:** $1,659.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Vegetables | 2033 | Vegetables is Primary Crop | Acres | $1,505.34 | 1 | $1,505.34 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 20 | $20.20 |
| Sulfate of Potash | 263 | Approved for Organic Systems - Muriate of Potash | Pound | $0.64 | 20 | $12.80 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 1 | $45.45 |

**Practice:** 332 - Contour Buffer Strips

**Scenario** #68 - Wildlife/Pollinator-High Value Cropland

**Scenario Description:**

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly pollinator friendly species. The area of the field border is taken out of production.

**Before Situation:**

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are grown in this field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

**After Situation:**

Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the wildlife/pollinator habitat requirements of the state and be adapted to the site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control sheet and rill erosion to tolerable levels on the cropped area of the field.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,677.25

**Scenario Cost/Unit:** $1,677.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Vegetables | 2033 | Vegetables is Primary Crop | Acres | $1,505.34 | 1 | $1,505.34 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |

**Practice:** 333 - Amending Soil Properties with Gypsum Products

**Scenario** #1 - Gypsum greater than 1 ton rate

**Scenario Description:**

Gypsum application of more than one ton/acre rate (typical average 1.5 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and supervisor/management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

**Before Situation:**

Cropland in continuous production having relatively low soil organic matter and moderately high clay content with application of manure with a risk of pathogens. Soil in these fields has poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and as a result of long term tillage systems have a high concentration of phosphorous near the soil surface. The combination of poor soil structure and high nutrient levels at the soil surface results in runoff events with high concentrations of DRP that may contribute to degraded water quality.

**After Situation:**

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field based on the existing soil samples will result in reduced runoff and improved runoff water quality. This condition over time in combination with an implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

**Feature Measure:** Acres with a gypsum product appli

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $10,911.31

**Scenario Cost/Unit:** $272.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 40 | $474.80 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Gypsum, Ground Ag Grade, Bulk | 1224 | Agricultural grade quarry ground gypsum ($CaCO_4$) for dispersive soil treatment. Materials and delivery only. | Ton | $173.05 | 60 | $10,383.00 |

**Practice:** 333 - Amending Soil Properties with Gypsum Products

**Scenario** #2 - Gypsum less than 1 ton per acre

**Scenario Description:**

Gypsum application of less than or equal to one ton/acre rate (typical average 1 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). . The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

**Before Situation:**

Cropland in continuous production having relatively low soil organic matter and moderately high clay content. Soil in these fields have poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and as a result of long term tillage systems have high concentration of phosphorous near the soil surface. The combination of poor soil structure and high nutrient levels at the soil surface results in runoff events with high concentrations of DRP that may contribute to degraded water quality.

**After Situation:**

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field is based on the existing soil samples and will result in reduce runoff and improve runoff water quality. This condition over time in combination with the implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

**Feature Measure:** Acres with a gypsum product appli

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $5,719.81

**Scenario Cost/Unit:** $143.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 40 | $474.80 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Gypsum, Ground Ag Grade, Bulk | 1224 | Agricultural grade quarry ground gypsum (CaCO4) for dispersive soil treatment. Materials and delivery only. | Ton | $173.05 | 30 | $5,191.50 |

**Practice:** 334 - Controlled Traffic Farming

**Scenario** #1 - Controlled Traffic

**Scenario Description:**

This practice must be part of a conservation management system to reduce soil compaction. This scenario considers the time needed to modify equipment, develop the technical skills necessary to effectively implement a controlled traffic farming system on a typical 200 acre cropland farm. The controlled traffic generally utilizes RTK automatic steering technology to locate and maintain high load field traffic. This scenario represents the costs associated with reducing the amount of surface area tracked/compacted to 33% or less. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

**Before Situation:**

The typical scenario for this practice is a 200 acre row crop operation on high clay, poorly drained soils. Studies show that when high wheel load traffic is not controlled, up to 85% of the field is tracked causing some degree of soil compaction. Before the practice is installed traffic is uncontrolled tracking and 85% of the field has compacted soil which limits soil health.

**After Situation:**

An Implementation Requirement for Controlled Traffic (334) is developed and the controlled traffic lanes installed per the implementation requirements. After the practice is installed wheel/track traffic is confined to designated traffic lanes/tramlines. Wheel/track soil compaction is confined to the traffic lanes to protect the remaining surface area and subsoil from wheel/track compaction. The wheel/track traffic follows the installed traffic lanes/tramlines each year.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $14,675.20

**Scenario Cost/Unit:** $73.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 80 | $10,582.40 |

**Practice:** 338 - Prescribed Burning

**Scenario** #1 - Understory Burn

**Scenario Description:**

Prescribed burning is accomplished in 20 acre increments to limit the off-site disruption of the burn. The burn is managed to keep the fire cool enough to not cause mortality to residulate stand, but also to burn hot enough to reduce the understory accomulation of residues. The prescribed burn is applied according to a designed burn plan and the NRCS prescribed burning (338) standard. The fire hazard is reduced by reducing the fuel load available in the understory. Associated Practice(s): Firebreak(394)

**Before Situation:**

An over accumulation of undersirable vegetation in the understory has a substantial wildfire risk due to the fuel load available in the understory. Leaf litter and debris are present throughout the stand. Competing and/or invasive species are hindering growth of desirable species.

**After Situation:**

A licensed entity implements a prescribed burn on 20 acres to enhance the native species stand and reduce wildlfire risks. The prescribed burn controls competing and/or invasive species. Growing conditions are altered to enhance health and productivity of the more desirable plants.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $1,892.42

**Scenario Cost/Unit:** $94.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 8 | $100.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $5.19 | 2 | $10.38 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 338 - Prescribed Burning

**Scenario** #2 - Site Preparation

**Scenario Description:**

A prescribed burn is implemented on a 5 acre site to eliminate the existing competition and debris to prepare site for planting, seeding, or permit natural seeding. A small 5 acre opening is created to promote a forest savannah habit within a forest that maintains early successional habitat for wildlife. Multiple sites are typically created throughout a management area. Small sites require intense management to ensure desired objectives are met and to reduce risk within forest stand. Associated Practice(s): Firebreak(394), Early Successional Habitat/Management (647), Upland Wildlife Habitat Management (645)

**Before Situation:**

A site that was recently managed to remove the overstory has remaining slash, brush and grasses that dominate the site providing inadequate cover/shelter and food for desired wildlife species.

**After Situation:**

A prescribed burn is implemented on the 5 acre site to eliminate the existing competition and debris. The grass, competing brush, and downed slah leftover from forestry activities are managed through the burn. Some bare ground is exposed. The burn alters the site to create forest openings. The burn prepares the site for seeding of early successional habitat or planting of desired vegetation. The altered site conditions promote growth of desired species to create a diverse plant community with adequate food and cover for wildlife.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $1,015.65

**Scenario Cost/Unit:** $203.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 4 | $74.20 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 4 | $50.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $5.19 | 1 | $5.19 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 338 - Prescribed Burning

**Scenario** #3 - Herbaceous Fuel

**Scenario Description:**

A prescribed burn is applied on 50 acres according to a design burn plan and the NRCS Prescribed Burning standard and specifications to control undersirable species, improve wildlife habitat, improve plant productivity and/or quality, and maintain ecological processes. A typical 50 acre parcel with herbaceous and/or low volatile woody fuel with no high volatile fuels is burned. Burned firbreaks used to achieve total firebreak width are part of these burns, but the construction of the firebreak is not included. Associated Practice(s): Firebreak (394) Upland Wildlife Management Habitat Management (645)

**Before Situation:**

A parcel of land with herbaceous fuel and/ or low volatile woody fuel with no high volatile fuels has undesirable plant composition due to reduced plant vigor, competing and invasive species, or improper livestock distribution.

**After Situation:**

The desirable plant composition is restored, plant vigor improved and invasive species reduced. Habitat component for wildlife is improved.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $2,225.17

**Scenario Cost/Unit:** $44.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 8 | $100.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $5.19 | 4 | $20.76 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 338 - Prescribed Burning

**Scenario** #4 - Volatile fuels < 4 ft tall

**Scenario Description:**

A prescribed burn is applied on 50 acres according to a design burn plan and the NRCS Prescribed Burning standard and specifications to control undersirable species, improve wildlife habitat, improve plant productivity and/or quality, and maintain ecological processes. A typical 50 acre parcel with herbaceous and/or low volatile woody fuel and high volatile woody fuels less than 4 feet tall are burned. Burned firbreaks used to achieve total firebreak width are part of these burns, but the construction of the firebreak is not included. Associated Practice(s): Firebreak (394) Upland Wildlife Habitat Management (645)

**Before Situation:**

A parcel of land with herbaceous fuel and/ or low volatile woody fuel and high volatile woody fuels less than 4 feet tall has undesirable plant composition due to reduced plant vigor, competing and invasive species, or improper livestock distribution.

**After Situation:**

The desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $2,980.77

**Scenario Cost/Unit:** $59.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 8 | $100.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $5.19 | 4 | $20.76 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 338 - Prescribed Burning

**Scenario** #5 - Volatile fuels > 4 ft tall

**Scenario Description:**

A prescribed burn is applied on 50 acres according to a design burn plan and the NRCS Prescribed Burning standard and specifications to control undersirable species, improve wildlife habitat, improve plant productivity and/or quality, and maintain ecological processes. A typical 50 acre parcel with herbaceous and/or low volatile woody fuel and high volatile woody fuels greater than 4 feet tall are burned. Burned firbreaks used to achieve total firebreak width are part of these burns, but the construction of the firebreak is not included. Associated Practice(s): Firebreak (394), Upland Wildlife Habitat Management (645)

**Before Situation:**

A parcel of land with herbaceous fuel and/ or low volatile woody fuel and high volatile woody fuels greater than 4 feet tall has undesirable plant composition due to reduced plant vigor, competing and invasive species, or improper livestock distribution.

**After Situation:**

The desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $3,697.17

**Scenario Cost/Unit:** $73.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 2 | $216.66 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Trailer, water tank | 1598 | Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment. | Hours | $21.79 | 8 | $174.32 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 12 | $150.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $5.19 | 4 | $20.76 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 340 - Cover Crop

**Scenario** #1 - Cover Crop - Basic (Organic and Non-organic)

**Scenario Description:**

Typically a small grain or legume (may also use forage sorghum, radishes, turnips, buckwheat, etc.) will be planted as a cover crop immediately after harvest of a row crop, and will be followed by a row crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide prior to planting the subsequent crop.

**Before Situation:**

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

**After Situation:**

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after harvest of the row crop, fields are planted with a small grain or legume cover crop (may also use forage sorghum, radishes, turnips, buckwheat, etc.), typically rye or clover. The average field size is 40 acres. The cover crop is seeded with a drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $3,267.20

**Scenario Cost/Unit:** $81.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 40 | $242.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 40 | $890.80 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 40 | $667.20 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 40 | $1,467.20 |

**Practice:** 340 - Cover Crop

**Scenario** #6 - Cover Crop - Adaptive Management

**Scenario Description:**

The practice scenario is for the implementation of cover crops in small replicated plots to allow the producer to learn how to manage cover crops on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular cover crop management strategy (e.g., cover crop vs no cover crop, multiple species vs, single species, evaluate different termination methods or timings, using a legume vs no legume for nitrogen credits). This will be done following the guidance in the NRCS Technical Note 10 - Adaptive Management.

**Before Situation:**

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil. The producer is considering the use of cover crops but is unsure how to manage on their unique operation or is seeking a way to better manage cover crops in the operation.

**After Situation:**

Implementation Requirements for Cover Crop (340) will be prepared along with the Adaptive Management plan for the replicated cover crop plots and implemented. Installation of this scenario will result in establishment of a cover crop replicated plots to compare to different management strategies for cover crop management following the guidance in the Agronomy Technical Note 10 - Adaptive Management. Implementation involves establishing the replicated plots to evaluate one or more cover crop management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in cover crop management. Results are used to make cover crop management decisions to address erosion and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

**Feature Measure:** Based on 10 acres

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,334.40

**Scenario Cost/Unit:** $3,334.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 20 | $1,023.20 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 10 | $572.40 |

**Practice:** 340 - Cover Crop

**Scenario** #11 - Cover Crop - Multiple Species (Organic and Non-organic)

**Scenario Description:**

Typically the multi-species cover crop (two or more species) mix includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc.). This mix will address all the purposes of the Cover Crop (340) standard. Typically the cover crop is seeded immediately after harvest of a row crop, but may be inter-seeded into a row crop using a broadcast seeder, drill, or similar device. The cover crop will be followed by another row crop and will utilize the residue as a mulch. The cover crop should be allowed to generate as much biomass as possible without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide or tillage prior to planting the subsequent crop and terminated per the NRCS Cover Crop Termination Guidelines.

**Before Situation:**

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

**After Situation:**

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after the harvest of row crop, fields are planted with a multi-species (2 or more species) cover crop mix that generally includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc. The average field size is 40 acres. The cover crop is seeded with a drill, broadcast seeder, aerial broadcast, or other method. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $4,089.60

**Scenario Cost/Unit:** $102.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 40 | $242.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 40 | $890.80 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 40 | $667.20 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 40 | $2,289.60 |

**Practice:** 340 - Cover Crop

**Scenario** #32 - Cover Crop - Basic Organic

**Scenario Description:**

"Typically a small grain or small grain-legume mix (may also use forage sorghum, radishes, turnips, buckwheat, etc) will be planted as a cover crop immediately after harvest of an organically grown crop, and will be followed by an organically grown crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a no-till drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechnical kill method (mowing, rolling, undercutting, etc.), within weeks prior to planting the subsequent crop. This scenario REQUIRES use of Certified Organic Seed. Associated practices: Conservation Cover (327), Conservation Crop Rotation (328), Residue and Tillage Management, No-Till/Strip Till/Direct Seed (329), Critical Area Planting (342), Residue Management, Seasonal (344), Residue and Tillage Management, Mulch Till (345), Residue and Tillage Management, Ridge Till (346), Nutrient Management (590), Integrated Pest Management (595)."

**Before Situation:**

Organically grown crops such as various vegetable and fruit crops (along with organically produced row crops) are grown and harvested in mid-late fall. Fields are disked immediately following harvest. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

**After Situation:**

Within 30 days after harvest of organic crop, fields are planted with a small grain-legume mix cover crop, typically rye and clover. The average field size is 25 acres. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop is terminated with using a mechnical kill method (mowing, rolling, undercutting, etc.), prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing resides. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

**Feature Measure:** Area Planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $3,280.20

**Scenario Cost/Unit:** $109.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 30 | $647.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 30 | $668.10 |
| **Materials** | | | | | | |
| Certified Organic, Annual Grasses, Legumes and/or Forbs | 2343 | Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only. | Acres | $65.49 | 30 | $1,964.70 |

**Practice:** 340 - Cover Crop

**Scenario** #58 - Cover Crop - 1 acre or less

**Scenario Description:**

Typically a small grain or legume will be planted as a cover crop immediately after harvest of a crop, and will be followed by a crop. This scenario assumes that seed will be planted by hand. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will typically be terminated by mowing or tilling prior to planting the subsequent crop.

**Before Situation:**

Crops such as sweet corn, vegetables, or root crops are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

**After Situation:**

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 10 days after harvest of the crop, fields are planted with a small grain or legume cover crop, typically rye or clover. The average field size is 0.25 acres. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

**Feature Measure:** area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.25

**Scenario Total Cost:** $142.15

**Scenario Cost/Unit:** $568.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Walk-behind Rototiller | 2723 | 8 hp walk-behind rototiller, one-day rental | Day | $154.81 | 0.25 | $38.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.25 | $14.31 |

**Practice:** 340 - Cover Crop

**Scenario** #82 - Mechanical Termination of Cover Crop per 1000 square feet

**Scenario Description:**

Typical cover crop is more than one plant species, planted immediately after harvest of a crop and will be followed by a new crop. Cover crops are planted in the production bed typically 4000 square feet. Implementation is mostly hand labor or labor intensive. Cover crop is mechanically terminated in urban agricultural sites with State and local laws, ordinance and zoning restrictions on use of agrichemicals.

**Before Situation:**

Crop rotation include specialty crops such sweet corn, vegetables, or root crops are grown and harvested through out growing season and into mid-late fall. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

**After Situation:**

Implementation Requirements according to Cover Crop (340) are prepared and implemented. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover at the critical period when cover is needed usually late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is mechanically terminated as late as feasible to maximize cover crop biomass production and meet the planting date needs of the next crop. Over time, soil health is improved due to additions of biomass, improvement of aggregate stability and infiltration/aeration.

**Feature Measure:** Area of Cover Crop Installed

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $107.92

**Scenario Cost/Unit:** $26.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 1.5 | $32.37 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.7 | $40.07 |

**Practice:** 340 - Cover Crop

**Scenario** #83 - Multi-species Cover Crop per 1000 square feet

**Scenario Description:**

Typical cover crop is more than one plant species, planted immediately after harvest of a crop and will be followed by a new crop. Cover crops are planted in the production bed typically 4000 square feet. Implementation is mostly hand labor or labor intensive. Cover crop is mechanically terminated in urban agricultural sites with State and local laws, ordinance and zoning restrictions on use of agrichemicals.

**Before Situation:**

Crop rotation include specialty crops such sweet corn, vegetables, or root crops are grown and harvested through out growing season and into mid-late fall. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

**After Situation:**

Implementation Requirements according to Cover Crop (340) are prepared and implemented. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover at the critical period when cover is needed usually late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is mechanically terminated as late as feasible to maximize cover crop biomass production and meet the planting date needs of the next crop. Over time, soil health is improved due to additions of biomass, improvement of aggregate stability and infiltration/aeration.

**Feature Measure:** Area of Cover Crop Installed

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $223.85

**Scenario Cost/Unit:** $55.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.7 | $40.07 |

**Practice:** 342 - Critical Area Planting

**Scenario** #1 - Native or Introduced Vegetation - Normal Tillage (Organic and Non-Organic)

**Scenario Description:**

Establishment of permanent vegetation (Native and Introduced) on a site (both organic and non-organic) that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

**Before Situation:**

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind and water erosion that exceed soil loss tolerances. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

**After Situation:**

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by applying fertilizer, lime and seed. Soil amendments will be incorporated at a depth of four to six inches to improve fertility and ensure establishment of permanent vegetative cover. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

**Feature Measure:** area seeded

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $494.35

**Scenario Cost/Unit:** $494.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 60 | $60.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 60 | $35.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |

**Practice:** 342 - Critical Area Planting

**Scenario** #4 - Native or Introduced Vegetation - Moderate Grading (Organic and Non-Organic)

**Scenario Description:**

Establishment of permanent vegetation (native and introduced) on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of small gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

**Before Situation:**

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc.) or human disturbance. The exposed areas have visible rills and small gullies averaging 1 foot in depth and 1 foot in width that requires some moderate grading to prepare a seedbed. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

**After Situation:**

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard.. This typical 1.0 acre critical area is stabilized by grading and shaping the small gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

**Feature Measure:** area seeded

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,024.23

**Scenario Cost/Unit:** $1,024.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 60 | $60.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 60 | $35.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 1 | $36.68 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |

**Practice:** 342 - Critical Area Planting

**Scenario** #6 - Native or Introduced Vegetation - Heavy Grading (Organic and Non-Organic)

**Scenario Description:**

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of moderate to severe gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

**Before Situation:**

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc.) or human disturbance. The exposed areas have visible rills and moderate to severe gullies averaging 3 feet in depth and 3 feet in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

**After Situation:**

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by grading and shaping the moderate to severe gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

**Feature Measure:** area seeded

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,453.58

**Scenario Cost/Unit:** $1,453.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 60 | $60.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 60 | $35.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 1 | $57.24 |

**Practice:** 342 - Critical Area Planting

**Scenario** #53 - Hydroseed

**Scenario Description:**

Establishment of permanent vegetation (Native and Introduced) on a site (both organic and non-organic) that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include a specialized hydroseed truck, grass/legume seed, companion crop, and fertilizer and lime with application. Hydroseeder required due to inaccessibility by other typical planting equipment or need to have moisture immediately present at seeding.

**Before Situation:**

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind and water erosion that exceed soil loss tolerances. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

**After Situation:**

Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by applying fertilizer, lime and seed. Soil amendments are not incorporated, but are in liquid form and readily adsorbed into the soil to improve fertility and ensure establishment of permanent vegetative cover. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,107.45

**Scenario Cost/Unit:** $2,107.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 1 | $11.87 |
| Seeding Operation, hydroseeder | 1291 | Hydroseeding with typical 1500 to 3600 gallon seeder. Includes all costs for equipment, power unit, and labor. | Acres | $1,097.40 | 1 | $1,097.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 60 | $60.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 60 | $35.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 1 | $57.24 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 342 - Critical Area Planting

**Scenario** #68 - Permanent Cover

**Scenario Description:**

Establishment of permanent vegetation on a site that is void of vegetation or needs to improve the vegetation to adequately cover the existing site soil to reduce particulate matter dust emissions. Costs include seedbed prep with light tillage, seed, fertilizer and lime. Small Scale fields and urban sites have soil conditions limiting vegetation growth or sensitive areas that need protection.

**Before Situation:**

Fields are bare or sparsely vegetated exposed to wind and water erosion. Soil physical of chemical properties limit vegetative growth. Urban site soils contain heavy metal contaminants at risk of emissions as particulate dust from field activities.

**After Situation:**

The Implementation Requirement with site specific instruction is prepared for each treatment site. The establishment of permanent vegetation will stabilize the soil. Sensitive areas are protected. Particulate dust is reduced. Wind and water erosion loss is within tolerance levels (T).

**Feature Measure:** planted area

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $338.20

**Scenario Cost/Unit:** $22.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.8 | $10.57 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.4 | $8.91 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Sulfate | 70 | Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.60 | 5 | $8.00 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 5 | $5.05 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 5 | $2.95 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $107.37 | 0.1 | $10.74 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 0.4 | $33.76 |

**Practice:** 345 - Residue and Tillage Management, Reduced Till

**Scenario** #2 - Residue and Tillage Management, Reduced Till

**Scenario Description:**

Mulch-till is managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled by the planter/drill or tillage tools prior to planting. This practice includes tillage methods commonly referred to as mulch tillage, vertical tillage, chiseling and disking, or the use of high disturbance drills without additional tillage. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops, to tillage for planted crops and to tillage for planting perennial crops. All residue shall be uniformly spread or managed over the surface throughout the critical erosion period(s). All residue shall be uniformly distributed over the entire field and not burned or removed. These periods of intensive tillage have led to excessive soil loss, often above the soil loss tolerance (T), due to the loss of crop residue on the soil surface. The NRCS erosion prediction model(s) will be used to review the farming operations and determine the amount of surface residue to manage throughout the rotation to keep soil loss below T. The producer will adopt a reduced till system to meet one or more of the practice purposes.

**Before Situation:**

Crops such as corn, soybeans, small grains, or cotton are grown and harvested. Fields are tilled immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increase. Sheet, rill and wind erosion occurs. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring. Runoff from the fields flows into streams, water courses or other water bodies causing water quality degradation. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil.

**After Situation:**

The Implementation Requirements are prepared following the criteria in the 345 Residue and Tillage Management, Reduced Till conservation practice standard. Reduced till applies to all cropland and other lands where crops are planted. This scenario includes the use of a reduce till systems and high disturbance drills, such as a hoe drill, air seeder, or no-till drill that disturbs a large percentage of soil surface during the planting operation. The residue that remains on the soil surface provides soil cover during late fall, throughout the winter, and into the early spring. Runoff and water/wind erosion are reduced and water quality improves. Over time, soil health is improved due to less tillage, the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $2,752.00

**Scenario Cost/Unit:** $27.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Strip Till Planter | 1230 | No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor. | Acres | $27.52 | 100 | $2,752.00 |

**Practice:** 345 - Residue and Tillage Management, Reduced Till

**Scenario** #3 - Mulch till-Adaptive Management

**Scenario Description:**

The practice scenario is for the implementation of mulch till in small replicated plots to allow the producer to learn how to manage mulch till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular mulch till management strategy (e.g., mulch till vs. conventional till, two different mulch till systems, etc.). This will be done following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management.

**Before Situation:**

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring prior to planting. Weed control is accomplished primarily through tillage, requiring multiple operations. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil. The producer is considering using mulch till technology, but is unsure how to manage on their operation or needs to improve the management of mulch till to be successful.

**After Situation:**

Implementation Requirements and the Adaptive Management Plan is prepared for the plots and implemented. Installation of this scenario will result in establishment of mulch till replicated plots to compare to different management strategies for mulch till and other residue management strategies following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management and the Adaptive Management Guidance 345 for Mulch Till. Implementation involves establishing the replicated plots to evaluate one or more reduced till management strategies. The plot will consist of at least four replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in reduced till management. Results are used to make reduced till management decisions to address erosion, soil health, and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content and residue levels measured as needed. This practice will be repeated for three years.

**Feature Measure:** Based on 20 acres

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,099.10

**Scenario Cost/Unit:** $5,099.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 20 | $264.20 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| Seeding Operation, No Till/Strip Till Planter | 1230 | No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor. | Acres | $27.52 | 10 | $275.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |

**Practice:** 345 - Residue and Tillage Management, Reduced Till

**Scenario** #67 - Reduced Tillage less than 0.5 acres

**Scenario Description:**

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Improve soil moisture efficiency, 4) Reduce plant pest pressures. This practice payment effectively implements a reduced tillage system on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

**Before Situation:**

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil-residue amounts average 10% or less. Full width tillage is performed prior to planting . Weed control is typically by cultivation.

**After Situation:**

The implementation requirements are written following CPS 345 Residue and Tillage Management, Reduced Tillage to treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure. Soil disturbance is minimized with no-till drill or planter use. May include single slot opener and seedling or plug planting follows. When pest management requires the removal of crop residue then planting beds are covered with cover crop using the 340 Cover Crop conservation practice. Runoff and erosion are reduced below T. No observed rills. Wind erosion reduced by maintaining surface cover. Over time, soil health is improved due to less tillage, the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

**Feature Measure:** area planted

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $619.50

**Scenario Cost/Unit:** $41.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.17 | $3.79 |
| Seeding Operation, No Till/Strip Till Planter | 1230 | No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor. | Acres | $27.52 | 0.17 | $4.68 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 9 | $289.98 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |

**Practice:** 348 - Dam, Diversion

**Scenario** #36 - Rock/Gravel Fill

**Scenario Description:**

A rock structure with a gravel bedding on geotextile is built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

**Before Situation:**

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

**After Situation:**

A rock structure of approximately 1050 cubic yards with a gravel bedding of approximately 450 cubic yards on approximately 200 square yards of geotextile, built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The rock structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

**Feature Measure:** Fill in Cubic Yards

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $168,251.74

**Scenario Cost/Unit:** $112.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1050 | $154,108.50 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 450 | $14,017.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 0.5 | $125.74 |

**Practice:** 348 - Dam, Diversion

**Scenario** #37 - Earth Fill

**Scenario Description:**

An earth fill built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial
uses.

**Before Situation:**

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

**After Situation:**

An earth fill structure of approximately 1500 cubic yards is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The earth fill structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control
(587).

**Feature Measure:** Volume of Earth Fill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $10,551.04

**Scenario Cost/Unit:** $7.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $296.87 | 30 | $8,906.10 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 30.5 | $1,519.21 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 0.5 | $125.74 |

**Practice:** 348 - Dam, Diversion

**Scenario** #38 - Earth Fill-Grouted Rock

**Scenario Description:**

An earth fill and grouted rock structure built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

**Before Situation:**

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

**After Situation:**

An earth fill and grouted rock structure of approximately 1050 cubic yards of earth fill with 450 cubic yards of grouted rock is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The earth fill and grouted rock structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

**Feature Measure:** Volume of Total Fill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $79,239.52

**Scenario Cost/Unit:** $52.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Scraper, self propelled, 21 CY | 1208 | Self propelled earthmoving scraper with 21 CY capacity. Does not include labor. | Hours | $296.87 | 21 | $6,234.27 |
| Rock Riprap, grouted | 1757 | Grouted Rock Riprap, includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $159.63 | 450 | $71,833.50 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 21 | $1,046.01 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 0.5 | $125.74 |

**Practice:** 348 - Dam, Diversion

**Scenario** #39 - Sheet Pile Structure

**Scenario Description:**

A sheet pile structure with rock, built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

**Before Situation:**

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

**After Situation:**

A sheet pile structure of approximately 3000 square feet with approximately 660 cubic yards of riprap is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The sheet pile structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

**Feature Measure:** Area of sheet pile

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,000.00

**Scenario Total Cost:** $198,536.73

**Scenario Cost/Unit:** $66.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Sheet piling, steel, 15 ft. | 1337 | Steel sheet pile, panels or barrier driven up to 15 feet and left in place. Includes materials, equipment and labor. | Square Feet | $33.23 | 3000 | $99,690.00 |
| Portable Welder | 1407 | Portable field welder. Equipment only. Labor not included. | Hours | $20.21 | 24 | $485.04 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24.5 | $1,253.42 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 660 | $96,868.20 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 0.5 | $240.07 |

**Practice:** 348 - Dam, Diversion

**Scenario** #40 - Reinforced Concrete Dam Diversion

**Scenario Description:**

A reinforced concrete dam diversion structure built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

**Before Situation:**

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

**After Situation:**

A reinforced concrete dam diversion structure of approximately 1500 cubic yards of concrete is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The reinforced concrete structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

**Feature Measure:** Volume of Total Fill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $812,948.84

**Scenario Cost/Unit:** $541.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1500 | $810,450.00 |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 10 | $1,850.10 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 10.5 | $523.01 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 0.5 | $125.74 |

**Practice:** 350 - Sediment Basin

**Scenario** #1 - Excavated volume Regional

**Scenario Description:**

An excavated sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. The sediment basin is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

**Before Situation:**

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

**After Situation:**

'The typical sediment basin is constructed by excavating 1500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

**Feature Measure:** Excavated volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $3,718.72

**Scenario Cost/Unit:** $2.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 23 | $2,321.62 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 23 | $1,145.63 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 350 - Sediment Basin

**Scenario** #2 - Embankment earthen basin with no pipe

**Scenario Description:**

An low hazard class embankment earthen sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with an earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

**Before Situation:**

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

**After Situation:**

The typical sediment basin is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 1500 cubic yards to create an embankment. The embankment will be designed and constructed according the pond standard (378). The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). No principal spillway will be used. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

**Feature Measure:** Embankment volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $3,718.72

**Scenario Cost/Unit:** $2.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 23 | $2,321.62 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 23 | $1,145.63 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 350 - Sediment Basin

**Scenario** #3 - Embankment earthen basin with pipe

**Scenario Description:**

An low hazard class embankment earthen sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with a principal spillway conduit and earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

**Before Situation:**

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

**After Situation:**

The typical sediment basin is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 1500 cubic yards to create an embankment. The embankment will be designed and constructed according the Pond standard (378). The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The principal spillway is created using an approved conduit material and filter diaphragm. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

**Feature Measure:** Embankment volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $10,562.92

**Scenario Cost/Unit:** $7.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 3 | $1,620.90 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 23 | $2,321.62 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 23 | $1,145.63 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 19.6 | $595.06 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1.6 | $49.84 |
| Pipe, CMP, 18-16 gauge, weight priced | 1322 | 18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only. | Pound | $2.26 | 1662 | $3,756.12 |
| Trash Guard, metal | 1608 | Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport. | Pound | $3.50 | 118 | $413.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 351 - Well Decommissioning

**Scenario** #1 - Shallow Well less than 20 ft deep

**Scenario Description:**

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

**Before Situation:**

Shallow well or hand dug well that is less than 20 feet deep. Assume 24" diameter casing. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

**After Situation:**

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit:** Feet

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $957.40

**Scenario Cost/Unit:** $63.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 0.6 | $3.85 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 1 | $53.21 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1.5 | $46.73 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 0.6 | $459.13 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 351 - Well Decommissioning

**Scenario** #2 - Shallow Well greater than 20 ft deep

**Scenario Description:**

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

**Before Situation:**

Shallow or hand dug well that is greater than 20 feet deep. Assume 24" diameter casing.

**After Situation:**

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidense. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit:** Feet

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $988.55

**Scenario Cost/Unit:** $32.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 0.6 | $3.85 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 1 | $53.21 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 2.5 | $77.88 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 0.6 | $459.13 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 351 - Well Decommissioning

**Scenario** #3 - Drilled well less than 300 ft deep

**Scenario Description:**

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

**Before Situation:**

Drilled well that is less than 300 feet deep. Assume 6" diameter casing.

**After Situation:**

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidense. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $806.92

**Scenario Cost/Unit:** $4.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 1 | $6.41 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 1 | $53.21 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1.5 | $46.73 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 0.4 | $306.08 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 351 - Well Decommissioning

**Scenario** #4 - Drilled well greater than 300 ft deep

**Scenario Description:**

A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water.

**Before Situation:**

Drilled well that is greater than 300 feet deep. Assume 6" diameter casing.

**After Situation:**

Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidense. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $1,134.37

**Scenario Cost/Unit:** $2.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 1 | $6.41 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 1 | $53.21 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 3 | $93.45 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 0.7 | $535.65 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 351 - Well Decommissioning

**Scenario** #5 - Hand dug Well

**Scenario Description:**

A licensed well driller/ or contractor will seal and permanently close an inactive, abandoned, or unusable hand dug water well to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations. Associated practices: 342 Critical Area Seeding

**Before Situation:**

Existing shallow well or hand dug well location allows for potential surface or near surface nutrient runoff to enter and contaminate ground water.

**After Situation:**

A 25' deep by 30" diameter hand dug well, water level 10' down to be sealed. Procedures and sealing materials shall conform to ASTM D5299 or applicable NRSC guidelines that are compatible with all local, State, Tribal, and Federal requirements. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidence. Included will be sealing zone and capping.

**Feature Measure:** Depth of well

**Scenario Unit:** Feet

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $1,034.36

**Scenario Cost/Unit:** $41.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 1 | $6.41 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $34.44 | 20 | $688.80 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 4 | $124.60 |

**Practice:** 353 - Monitoring Well

**Scenario** #14 - Borehole, 200 Ft. Depth or Less

**Scenario Description:**

A vertical borehole designed and installed 200 feet or less in depth to obtain representative groundwater quality samples and hydrogeologic information. The well provides controlled access for sampling groundwater near an agricultural waste storage or treatment facility to detect seepage and monitor groundwater quality. Installation methods must be in conformance with ASTM D5092. The resource concerns addressed include groundwater contamination and groundwater quality.

**Before Situation:**

This practice applies to the design, installation, and development of monitoring wells where contamination of groundwater from an agricultural waste storage or treatment facility is a concern, detection of seepage and monitoring of groundwater quality is needed, and the facility is a component of an agricultural waste management system.

**After Situation:**

Typical installation of a vertical borehole for a monitoring well 100 feet deep that provides controlled access to obtain water samples for detecting seepage and monitoring of groundwater quality from an agricultural waste storage or treatment facility as a component of an agricultural waste management system. The monitoring well is installed by drilling an 8 inch borehole, installing a protective casing, a 2 inch riser pipe, a well screen, and filter pack. The installation method was in conformance with ASTM D5092. Vegetation of disturbed areas will be completed under critical area planting (342). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Access Control (472), Water Well Decommissioning (351), Waste Storage Facility (313), Waste Treatment Lagoon (359), and Pumping Plant (533).

**Feature Measure:** Depth of Well

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $13,446.17

**Scenario Cost/Unit:** $134.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 25 | $8,904.25 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $34.44 | 6 | $206.64 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 6 | $186.90 |
| Aggregate, gravel, washed, pea gravel | 1331 | Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $34.53 | 3 | $103.59 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 3 | $2,295.63 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $52.34 | 1 | $52.34 |
| Well Casing, Metal, 6 in. | 1810 | Steel well casing, 6 inch. Materials only. | Feet | $33.74 | 20 | $674.80 |
| Well Screen, plastic, 2 in. | 1997 | 2 inch PVC well screen. Materials only. | Feet | $4.90 | 25 | $122.50 |
| Pipe, PVC, Flush Thread, 2 in. SCH 40 | 2295 | Flush thread PVC riser pipe, 2 inch diameter, schedule 40. Materials only. | Feet | $3.64 | 110 | $400.40 |
| Centralizer, stainless steel, 2 inch | 2298 | Stainless steel centralizer to stabilize and center pipe in groundwater monitoring and other well installations. Materials only. | Each | $24.53 | 10 | $245.30 |
| End Cap, PVC, 2 in. | 2301 | PVC End cap used in groundwater monitoring and other well installations. Materials only. | Each | $2.35 | 1 | $2.35 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 353 - Monitoring Well

**Scenario** #15 - Borehole, Greater Than 200 Ft. Depth

**Scenario Description:**

A vertical borehole designed and installed greater than 200 feet deep to obtain representative groundwater quality samples and hydrogeologic information. The well provides controlled access for sampling groundwater near an agricultural waste storage or treatment facility to detect seepage and monitor groundwater quality. Installation methods must be in conformance with ASTM D5092. The resource concerns addressed include groundwater contamination and groundwater quality.

**Before Situation:**

This practice applies to the design, installation, and development of monitoring wells where contamination of groundwater from an agricultural waste storage or treatment facility is a concern, detection of seepage and monitoring of groundwater quality is needed, and the facility is a component of an agricultural waste management system.

**After Situation:**

Typical installation of a vertical borehole for a monitoring well 300 feet deep that provides controlled access to obtain water samples for detecting seepage and monitoring of groundwater quality from an agricultural waste storage or treatment facility as a component of an agricultural waste management system. The monitoring well is installed by drilling an 8 inch borehole, installing a protective casing, a 2 inch monitoring-riser pipe, a well screen, and filter pack. The installation method was in conformance with ASTM D5092. Vegetation of disturbed areas will be completed under critical area planting (342). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Access Control (472), Water Well Decommissioning (351), Waste Storage Facility (313), Waste Treatment Lagoon (359), and Pumping Plant (533).

**Feature Measure:** Depth of Well

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $40,841.95

**Scenario Cost/Unit:** $136.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 91 | $32,411.47 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $34.44 | 12 | $413.28 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 12 | $373.80 |
| Aggregate, gravel, washed, pea gravel | 1331 | Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $34.53 | 6 | $207.18 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 6 | $4,591.26 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $52.34 | 1 | $52.34 |
| Well Casing, Metal, 6 in. | 1810 | Steel well casing, 6 inch. Materials only. | Feet | $33.74 | 20 | $674.80 |
| Well Screen, plastic, 2 in. | 1997 | 2 inch PVC well screen. Materials only. | Feet | $4.90 | 50 | $245.00 |
| Pipe, PVC, Flush Thread, 2 in. SCH 40 | 2295 | Flush thread PVC riser pipe, 2 inch diameter, schedule 40. Materials only. | Feet | $3.64 | 310 | $1,128.40 |
| Centralizer, stainless steel, 2 inch | 2298 | Stainless steel centralizer to stabilize and center pipe in groundwater monitoring and other well installations. Materials only. | Each | $24.53 | 20 | $490.60 |
| End Cap, PVC, 2 in. | 2301 | PVC End cap used in groundwater monitoring and other well installations. Materials only. | Each | $2.35 | 1 | $2.35 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 355 - Groundwater Testing

**Scenario** #1 - Basic Water Test

**Scenario Description:**

Typical scenario includes the professional testing for nitrates, nitrites, and coliform to confirm well water meets basic water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be acceptable. Associated Practices: Irrigation System Microirrigation (441), Irrigation System Sprinkler (442), Irrigation Water Management (449), Prescribed Grazing (528), Watering Facility (614), Water Well (642).

**Before Situation:**

There are no known contaminants of the well, however, neighboring wells have known issues with nitrates, or coliform, and confirmation of acceptable water quality is desired. Manure is spread near to the well, following a nutrient management plan; well contamination is unlikely but possible.

**After Situation:**

Water quality results are known.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $69.82

**Scenario Cost/Unit:** $69.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 0.5 | $16.11 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Irrigation Suitability | 310 | Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness. | Each | $53.71 | 1 | $53.71 |

**Practice:** 355 - Groundwater Testing

**Scenario** #2 - Specialty Water Test

**Scenario Description:**

Typical scenario includes the professional testing for pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be degraded due to a specialized substance. Associated Practices: Irrigation System Microirrigation (441), Irrigation System Sprinkler (442), Irrigation Water Management (449), Prescribed Grazing (528), Watering Facility (614), Water Well (642).

**Before Situation:**

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is possible.

**After Situation:**

Water quality results are known.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $261.27

**Scenario Cost/Unit:** $261.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 0.5 | $16.11 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Irrigation Suitability | 310 | Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness. | Each | $53.71 | 1 | $53.71 |
| Test, singular specialized water test, well water | 2003 | Testing for specific pesticide, inorganic chemical or volatile organic not included in a basic well suitability test. Includes materials and shipping only. | Each | $191.45 | 1 | $191.45 |

**Practice:** 355 - Groundwater Testing

**Scenario** #3 - Full Spectrum Test

**Scenario Description:**

Typical scenario includes the professional comprehensive testing for all less common substances, to include: pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is known to be degraded due to a specialized substance but thorough analysis is warranted. Associated Practices: Irrigation System Microirrigation (441), Irrigation System Sprinkler (442), Irrigation Water Management (449), Prescribed Grazing (528), Watering Facility (614), Water Well (642).

**Before Situation:**

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, sewage sludge, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is likely.

**After Situation:**

Water quality results are known.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $366.24

**Scenario Cost/Unit:** $366.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 0.5 | $16.11 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Irrigation Suitability | 310 | Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness. | Each | $53.71 | 1 | $53.71 |
| Test, comprehensive specialized water test, well water | 2002 | Comprehensive testing for a broad spectrum of pesticides, inorganic chemicals or volatile organics not included in a basic well suitability test. Includes materials and shipping only. | Each | $296.42 | 1 | $296.42 |

**Practice:** 356 - Dike and Levee

**Scenario** #1 - Material haul < 1 mile

**Scenario Description:**

Construction of a barrier, constructed of an earthen embankment, to control water level. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. Material haul < 1 mile. Associated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

**Before Situation:**

Site is subject to flooding or indundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife managment; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance. Material haul < 1 mile.

**After Situation:**

Water level controlled by a stable earthen structure. Potential hazard to public safety, land or property mitigated; environmental benefit provided.

**Feature Measure:** Volume of Earthfill (including volu

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $32,950.54

**Scenario Cost/Unit:** $7.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4500 | $11,520.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 4500 | $18,945.00 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 356 - Dike and Levee

**Scenario** #2 - Material haul > 1 mile

**Scenario Description:**

Construction of a barrier, constructed of an earthen embankment, to control water level. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability. Material haul > 1 mile. Associated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

**Before Situation:**

Site is subject to flooding or indundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife managment; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance. Material haul > 1 mile.

**After Situation:**

Water level controlled by a stable earthen structure. Potential hazard to public safety, land or property mitigated; environmental benefit provided.

**Feature Measure:** Volume of Earthfill (including volu

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $36,370.54

**Scenario Cost/Unit:** $8.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4500 | $11,520.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 4500 | $18,945.00 |
| Hauling, bulk, highway truck | 1615 | Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck. | Cubic Yard Mile | $0.38 | 9000 | $3,420.00 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 356 - Dike and Levee

**Scenario** #46 - Shallow embankment, material excavated onsite and hauled

**Scenario Description:**

Typical embankment built in crop field to inhibit surface drainage and support shallow water areas and wetlands for wildlife. Material excavated onsite but not adjacent to embankment. Based on average height of 2 feet typically NTE 4 feet in height from existing ground, 4:1 side slopes, and 8-foot top width. Associated practices: Shallow Water Area Development and Management (646), Wetland Restoration (657), Wetland Creation (658), Wetland Enhancement (659), Wetland Wildlife Habitat Management (644), Structure for Water Control (587), Critical Area Planting (342).

**Before Situation:**

Crop field with soils capable of supporting perched water table and surface ponding, slopes of 1 to 3 percent, typically with surface drainage to prevent ponding during growing season.

**After Situation:**

Linear embankment constructed, often adjacent to drainage ditch, prevents surface flow to ditch, and results in surface ponding during wet season, including early portion of growing season. Water control structure and emergency spillway installed to manage water levels and protect embankment structural integrity.

**Feature Measure:** Linear foot of embankment

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $15,907.96

**Scenario Cost/Unit:** $15.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1770 | $7,451.70 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 427 | $388.57 |
| Excavation, common earth, large equipment, 1500 ft | 1221 | Bulk excavation of common earth including sand and gravel with scrapers with average haul distance of 1500 feet. Includes equipment and labor. | Cubic Yards | $3.70 | 1770 | $6,549.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 356 - Dike and Levee

**Scenario** #47 - Shallow embankment, earthfill adjacent

**Scenario Description:**

Typical embankment built in crop field to inhibit surface drainage and support shallow water areas and wetlands for wildlife. Material excavated adjacent to or within 50' of embankment. Based on average height of 2 feet typically NTE 4 feet in height from existing ground, 4:1 side slopes, and 8-foot top width. Associated practices: Shallow Water Area Development and Management (646), Wetland Restoration (657), Wetland Creation (658), Wetland Enhancement (659), Wetland Wildlife Habitat Management (644), Structure for Water Control (587), Critical Area Planting (342).

**Before Situation:**

Crop field with soils capable of supporting perched water table and surface ponding, slopes of 1 to 3 percent, typically with surface drainage to prevent ponding during growing season.

**After Situation:**

Linear embankment constructed, often adjacent to drainage ditch, prevents surface flow to ditch, and results in surface ponding during wet season, including early portion of growing season. Water control structure and emergency spillway installed to manage water levels and protect embankment structural integrity.

**Feature Measure:** Linear foot of embankment

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $11,728.53

**Scenario Cost/Unit:** $11.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1770 | $7,451.70 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 427 | $388.57 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 1770 | $2,849.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 359 - Waste Treatment Lagoon

**Scenario** #6 - Waste Treatment Lagoon

**Scenario Description:**

A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of animal agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. Earthen lagoon liners are addressed with another standard. This scenario intended for embankment or excavated lagoon. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Concrete (522), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Waste Separation Facility (632).

**Before Situation:**

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

**After Situation:**

A waste treatment lagoon constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Excavated material used to build an embankment around the lagoon so this is a combination excavated/embankment design. Typical design size : Design Volume 492,129 cf = 18,227 cy; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13' which includes 1' freeboard Feature Measure = Design Volume [Operational Volume + emergency volume + freeboard]

**Feature Measure:** Design Volume (Operational + eme

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 492,129.00

**Scenario Total Cost:** $104,898.01

**Scenario Cost/Unit:** $0.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 9102 | $38,319.42 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 8101 | $29,406.63 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1389 | $1,263.99 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 9125 | $35,131.25 |
| **Materials** | | | | | | |
| Structural steel tubing, 2 in. diameter | 1120 | Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only | Feet | $5.64 | 8 | $45.12 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #1 - Poultry House Soil Remediation

**Scenario Description:**

This practice scenario includes the remediation of the soil in an abandoned poultry structures previously used to store poultry waste (litter) on an earthen floor. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342).

**Before Situation:**

The abandoned poultry house has a damaged roof exposing the earthen floor of the structure to rainfall. Rainfall and nutrients on the floor of the house pose a risk to surface water from contaminated runoff or to ground water from seepage into the underlying soils.

**After Situation:**

This scenario is based on a 40' wide x 400' long poultry house with 1 foot depth of nutrient laden soil to remediate (16,000 CF). Payment under this scenario includes only activities associated with the soil remediation. Soil remediation activities in this scenario include removing the nutrient enriched soil found in the first 7 inches of soil beneath the litter floor and mixing wood chips with the remaining 5 inches of soil. Nutrient level testing and field application of the removed soil shall be performed according to nutrient planning in conformance with Nutrient Management, Code 590. The remaining 5 inches of soil will be remediated in-situ by mixing in wood chips, at a rate of 33% of the volume of remaining soil, for the purpose of nitrogen sequestration. Additional soil will be hauled in (estimated at 110% of the soil volume that was removed for field application) to backfill the depression. Shaping and crowning of the soil material on the disturbed area and critical area seeding will be done to provide drainage, complete the site remediation and establish vegetation. Operation and maintenance of the site will include nutrient testing the following year to determine if the nutrients in the mixed soil have been remediated and surface and ground water resource concerns have been addressed. In this scenario, samples at four (4) locations will be taken at 6, 12, 18 and 24 inches at the end of Year 1.

**Feature Measure:** Cubic feet of soil remediated

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 16,000.00

**Scenario Total Cost:** $16,456.35

**Scenario Cost/Unit:** $1.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 380 | $1,379.40 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 31 | $3,878.41 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 19 | $2,334.53 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 1 | $63.33 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 82 | $4,630.54 |
| Front End Loader, 185 HP | 1619 | Wheeled front end loader with horsepower range of 160 to 210. Equipment and power unit costs. Labor not included. | Hours | $104.89 | 6 | $629.34 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 31 | $1,544.11 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 16 | $248.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #2 - Feedlot Closure

**Scenario Description:**

This practice scenario includes the remediation of the soil on an abandoned feedlot previously used to feed animals on a bare earthen lot. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342).

**Before Situation:**

The feedlot is abandoned. Vegetation has not been reestablished. The high level of nutrients in the soil is preventing volunteer establishment of native vegetation. Rainfall and nutrients on the bare earth feedlot pose a risk to surface water from contaminated runoff or to ground water from seepage into the underlying soils.

**After Situation:**

This scenario is based on a 3 acre feedlot. Surveys and testing have determined the manure pack averages 8 inches in depth and the level of nutirients in the 4 inches of soil below the manure pack is too high to treat insitu with vegetation. Payment under this scenario includes only activities associated with the soil remediation. Soil remediation activities in this scenario include removing the nutrient enriched manure pack and soil, an average of 12 inches below the existing surface (130,680 CF). The excavated surface will be vegetated with a mix of salt tolerant plants in conformance with Critical Area Planting, Code 342. Nutrient level testing and field application of the removed soil shall be performed according to nutrient planning in conformance with Nutrient Management, Code 590. Shaping and crowning of the soil material on the disturbed area and critical area seeding will be done to provide drainage, complete the site remediation and establish vegetation. Operation and maintenance of the site will include nutrient testing the following year to determine if the soil has been remediated and surface and ground water resource concerns have been addressed. In this scenario, samples at four (4) locations will be taken at 6, 12, 18 and 24 inches at the end of Year 1. Fence and feedbunk removal is to be performed under Obstruction Removal, Code 500.

**Feature Measure:** Cubic feet of soil remediated

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 130,680.00

**Scenario Total Cost:** $40,799.77

**Scenario Cost/Unit:** $0.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 40 | $5,004.40 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 269 | $33,052.03 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 40 | $1,992.40 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 16 | $248.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #3 - Demolition of Concrete Waste Storage Structure

**Scenario Description:**

This practice scenario includes the demolition of a concrete waste storage structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing concrete waste storage structure is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a concrete waste storage structure, with top dimensions of 60 ft x 60 ft with 10 ft vertical walls. The walls are 8 inches thick, the concrete floor is 5 inches thick and the footing for the wall is 12 inches wide by 24 inches deep. The total structural storage volume equals 36,000 cubic feet. The total volume of concrete to be demolished is 3,580 cubic feet ([2 X (60 ft + 60 ft) X 10ft X 8in /12 in/ft] + [60 ft X 60 ft X 5in /12 in/ft] + [2 X (60 ft + 60 ft) X 12in /12 in/ft X 24in /12in/ft]). The volume of waste to be removed approximately equals 50% of the structural volume (50% X 36,000 = 18,000 CF). The volume of earthwork (earthfill and/or excavation, final grading) required is approximately 50% of the structural volume. The concrete will be demolished and hauled off-site for recycling or disposal. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Demolition of a concrete waste storage structure includes agitating, removing, and spreading the waste remaining in the structure. All waste material shall be land applied in accordance with Nutrient Management (590). Excavated areas will be filled in. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Demolition of the concrete waste structure will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

**Feature Measure:** Cubic Feet of concrete to be demol

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 3,580.00

**Scenario Total Cost:** $13,519.77

**Scenario Cost/Unit:** $3.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 667 | $2,808.07 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 24 | $3,002.64 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallons | $0.01 | 134640 | $1,346.40 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 133 | $1,603.98 |
| Hauling, bulk, highway truck | 1615 | Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck. | Cubic Yard Mile | $0.38 | 2660 | $1,010.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #4 - Liquid Waste Impoundment Closure with 75% Liquids and 25% Solids

**Scenario Description:**

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 75% liquid/slurry waste and 25% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 75% if the structural volume (75% X 63,851 CF = 47,888 CF). The volume of solid waste to be removed approximately equals 25% of the structural volume (25% X 63,851 = 15,963 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

**Feature Measure:** Cubic feet of structural storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 63,851.00

**Scenario Total Cost:** $14,552.70

**Scenario Cost/Unit:** $0.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 709 | $1,815.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 473 | $1,991.33 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 12 | $1,501.32 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallons | $0.01 | 358204 | $3,582.04 |
| Spreading, manure sludge | 1633 | Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs. | Cubic Feet | $0.20 | 15963 | $3,192.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #5 - Liquid Waste Impoundment Closure with 50% Liquids and 50% Solids

**Scenario Description:**

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 50% liquid/slurry waste and 50% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% if the structural volume (50% X 63,851 CF = 31,925 CF). The volume of solid waste to be removed approximately equals 50% of the structural volume (50% X 63,851 = 31,925 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

**Feature Measure:** Cubic feet of structural storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 63,851.00

**Scenario Total Cost:** $16,551.09

**Scenario Cost/Unit:** $0.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 709 | $1,815.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 473 | $1,991.33 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 12 | $1,501.32 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallons | $0.01 | 238803 | $2,388.03 |
| Spreading, manure sludge | 1633 | Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs. | Cubic Feet | $0.20 | 31925 | $6,385.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #6 - Liquid Waste Impoundment Closure with 25% Liquids and 75% Solids

**Scenario Description:**

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 25% liquid/slurry waste and 75% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 25% if the structural volume (25% X 63,851 CF = 15,9635 CF). The volume of solid waste to be removed approximately equals 75% of the structural volume (75% X 63,851 = 47,888 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

**Feature Measure:** Cubic feet of structural storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 63,851.00

**Scenario Total Cost:** $18,549.67

**Scenario Cost/Unit:** $0.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 709 | $1,815.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 473 | $1,991.33 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 12 | $1,501.32 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallons | $0.01 | 119401 | $1,194.01 |
| Spreading, manure sludge | 1633 | Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs. | Cubic Feet | $0.20 | 47888 | $9,577.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #7 - Liquid Waste Impoundment Closure with 0% Liquids and 100% Solids

**Scenario Description:**

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 0% liquid/slurry waste and 100% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 0% of the structural volume. The volume of solid waste to be removed approximately equals 100% of the structural volume (63,851 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

**Feature Measure:** Cubic feet of structural storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 63,851.00

**Scenario Total Cost:** $20,296.79

**Scenario Cost/Unit:** $0.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 709 | $1,815.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 473 | $1,991.33 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 12 | $1,501.32 |
| Spreading, manure sludge | 1633 | Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs. | Cubic Feet | $0.20 | 63851 | $12,770.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #8 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 75% Liquids and 25% Solids

**Scenario Description:**

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 75% liquid/slurry waste and 25% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 75% if the structural volume (75% X 63,851 CF = 47,888 CF). The volume of solid waste to be removed approximately equals 25% of the structural volume (25% X 63,851 = 15,963 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

**Feature Measure:** Cubic feet of structural storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 63,851.00

**Scenario Total Cost:** $10,414.55

**Scenario Cost/Unit:** $0.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 118 | $496.78 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallons | $0.01 | 358204 | $3,582.04 |
| Spreading, manure sludge | 1633 | Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs. | Cubic Feet | $0.20 | 15963 | $3,192.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #9 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 50% Liquids and 50% Solids

**Scenario Description:**

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 50% liquid/slurry waste and 50% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 50% of the structural volume (50% X 63,851 CF = 31,925 CF). The volume of solid waste to be removed approximately equals 50% of the structural volume (50% X 63,851 = 31,925 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

**Feature Measure:** Cubic feet of structural storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 63,851.00

**Scenario Total Cost:** $12,412.94

**Scenario Cost/Unit:** $0.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 118 | $496.78 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallons | $0.01 | 238803 | $2,388.03 |
| Spreading, manure sludge | 1633 | Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs. | Cubic Feet | $0.20 | 31925 | $6,385.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #10 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 25% Liquids and 75% Solids

**Scenario Description:**

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 25% liquid/slurry waste and 75% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 25% of the structural volume (25% X 63,851 CF = 15,963 CF). The volume of solid waste to be removed approximately equals 75% of the structural volume (75% X 63,851 = 47,888 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

**Feature Measure:** Cubic feet of structural storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 63,851.00

**Scenario Total Cost:** $14,411.52

**Scenario Cost/Unit:** $0.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 118 | $496.78 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallons | $0.01 | 119401 | $1,194.01 |
| Spreading, manure sludge | 1633 | Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs. | Cubic Feet | $0.20 | 47888 | $9,577.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 360 - Waste Facility Closure

**Scenario** #11 - Liquid Waste Impoundment Conversion to Fresh Water Storage with 0% Liquids and 100% Solids

**Scenario Description:**

This practice scenario includes the conversion of an earthen liquid waste impoundment (embankment or excavated type) to fresh water storage where the estimated volume of waste to be removed is approximately 0% liquid/slurry waste and 100% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Associated practices: Nutrient Management (590), Critical Area Planting (342)

**Before Situation:**

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

**After Situation:**

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 0% of the structural volume. The volume of solid waste to be removed approximately equals 100% of the structural volume (47,888 CF). The volume of earthwork (earthfill and/or excavation) required to meet current NRCS standards and perform final grading and shaping of the site is approximately 5% of the structural volume. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Conversion of a liquid waste storage impoundment for fresh water storage includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be brought up to current NRCS standards for its intended purpose. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Conversion to fresh water storage will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment.

**Feature Measure:** Cubic feet of structural storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 63,851.00

**Scenario Total Cost:** $16,158.64

**Scenario Cost/Unit:** $0.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 118 | $496.78 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Spreading, manure sludge | 1633 | Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs. | Cubic Feet | $0.20 | 63851 | $12,770.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 362 - Diversion

**Scenario** #1 - Diversion, large, greater than 300 feet

**Scenario Description:**

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 1000 feet long installed on a field slope of 5 percent and requires 1 CY excavation per LF. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced. Associated practices: Critical Area Planting (342), Grassed Waterway (412), Lined Waterway (468), Mulching (484), Structure for Water Control (587), Subsurface Drainage (606), and Underground Outlet (620).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Diversion is installed . Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste.

**Feature Measure:** Length of Diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $5,170.02

**Scenario Cost/Unit:** $5.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 550 | $500.50 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 1000 | $3,850.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.35 | $124.62 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.18 | $55.13 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.18 | $45.38 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 362 - Diversion

**Scenario** #2 - Diversion, small, less than or equal to 300 feet

**Scenario Description:**

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 200 feet long installed on a field slope of 5 percent and requires 1 CY excavation per LF. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced. Associated practices: Critical Area Planting (342), Grassed Waterway (412), Lined Waterway (468), Mulching (484), Structure for Water Control (587), Subsurface Drainage (606), and Underground Outlet (620).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Diversion is installed . Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste.

**Feature Measure:** Length of Diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $1,340.29

**Scenario Cost/Unit:** $6.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 110 | $100.10 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 200 | $770.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.07 | $24.92 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.04 | $12.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.04 | $10.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 362 - Diversion

**Scenario** #3 - Diversion, Rebuild

**Scenario Description:**

An existing earthen channel beyond its service life requires reconstruction to re-establish capacity and grade to be constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Typical diversion is, 1000 feet long installed on a field slope of 5 percent and requires .75 CY excavation per LF. Channel may be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced. Associated practices: Critical Area Planting (342), Grassed Waterway (412), Lined Waterway (468), Mulching (484), Structure for Water Control (587), Subsurface Drainage (606), and Underground Outlet (620).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

A rebuilt diversion has been installed. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste.

**Feature Measure:** Linear feet of rebuilt diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $3,709.39

**Scenario Cost/Unit:** $3.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 250 | $227.50 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 750 | $2,887.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 362 - Diversion

**Scenario** #7 - Concrete Curb

**Scenario Description:**

A reinforced concrete (RC) curb constructed across the slope to divert runoff away from farmsteads, gullies, critical erosion areas, construction areas, agricultural waste system, other sensitive areas, or to a waste storage facility. Outlet may be a waterway, underground outlet, or other suitable outlet. Typical 1.0 ft. high, 6 inch thick RC curb diversion is approximately 50 feet long with a 2.0 ft wide footing and requires approximately 0.056 CY of RC per linear ft. The curb will be placed on 6" of compacted sand. Concrete diversion is necessary due to limited footprint availability.

**Before Situation:**

Excessive roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. Also, contaminated lot runoff that needs to be diverted to a waste storage facility so it doesn't pollute surface water or ground water.

**After Situation:**

The 1.0 ft. high, 6 inch thick RC curb diversion is approximately 50 feet long. "Clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Polluted water is diverted to a waste storage facility for proper storage. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Waste Storage Facility (313).

**Feature Measure:** Length of concrete diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $1,853.10

**Scenario Cost/Unit:** $37.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2.8 | $1,512.84 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 2.15 | $5.50 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 3.7 | $23.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 1.85 | $56.17 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 362 - Diversion

**Scenario** #13 - Diversion

**Scenario Description:**

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 1000 feet long installed on a field slope of 5 percent and requires 1 CY excavation per LF. Channel my be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Diversion is 1000 feet long installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

**Feature Measure:** Length of Diversion

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $2,982.93

**Scenario Cost/Unit:** $2.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 1000 | $2,560.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #7 - Covered Lagoon/Holding Pond

**Scenario Description:**

A covered lagoon is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The waste holding/treatment area is covered by waste treatment lagoon (359) or waste storage facility (313) and the cover is addressed under roofs and covers (367). Costs for this scenario are only for system controls, gas collection, and flaring system. The digester type selected is based on effluent consistency. Energy generation is not included. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

**Before Situation:**

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

**After Situation:**

A covered lagoon/holding pond with a flexible top is installed over an earthen storage/treatment facility for the purposes of capturing biogas. Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan. Typical Design Scenario: 1,000 animal units (715 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $474,179.24

**Scenario Cost/Unit:** $474.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Anaerobic Digester Gas Collection and Flare System | 2484 | Piping and collection system for biogas, controls for operating the digester system, flare excess gas to convert from methane to carbon dioxide Includes material, labor, and equipment. | Each | $473,750.00 | 1 | $473,750.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #16 - Anaerobic Digester

**Scenario Description:**

An anaerobic digester can be part of a waste management system. It provides biological treatment of the waste in the absence of oxygen. This process for manure and other by-products of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a generic anaerobic digester. Energy generation is not included with this scenario. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

**After Situation:**

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. The typical scenario also includes items necessary to maintain mesophylic or thermophylic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario is each.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,706,017.70

**Scenario Cost/Unit:** $1,706,017.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 2 | $216.66 |
| **Equipment Installation** | | | | | | |
| Anaerobic Digester | 2478 | Concrete anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation, piping and collection system for biogas, controls for operating digester and boiler system, boiler needed to maintain digester temperature, and flare excess gas to convert from methane to carbon dioxide. Includes material, labor, and equipment. | Each | $1,705,000.00 | 1 | $1,705,000.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 367 - Roofs and Covers

**Scenario** #1 - Flexible Roof

**Scenario Description:**

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports attached to an existing wall or with its own simple support system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

**After Situation:**

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 40'x40 'square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

**Feature Measure:** Footprint of the building

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,600.00

**Scenario Total Cost:** $20,325.44

**Scenario Cost/Unit:** $12.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Roof, Hoop Truss Arch Structure, 30-60' wide | 1668 | Hoop Truss Arch Structure with fabric cover - 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation. | Square Feet | $12.66 | 1600 | $20,256.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 367 - Roofs and Covers

**Scenario** #2 - Flexible Roof, complex foundation

**Scenario Description:**

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and complex support system. Requires construction of anchor holes with concrete. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

**After Situation:**

A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 40'x40 'square feet and support by 2 rows of treated posts. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

**Feature Measure:** Footprint of the building

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,600.00

**Scenario Total Cost:** $22,309.70

**Scenario Cost/Unit:** $13.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 3 | $641.52 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 12 | $76.92 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| Auger, Truck Mounted | 2049 | Truck mounted auger for large diameter excavation. Includes equipment and labor. | Hours | $107.79 | 4 | $431.16 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Materials** | | | | | | |
| Roof, Hoop Truss Arch Structure, 30-60' wide | 1668 | Hoop Truss Arch Structure with fabric cover - 30' to 60' width, includes materials, equipment, and installation. Does not include foundation preparation. | Square Feet | $12.66 | 1600 | $20,256.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 367 - Roofs and Covers

**Scenario** #3 - Timber Frame Roof, over small bins

**Scenario Description:**

A timber framed roof, non-truss, a combination of purlins and rafters covered with steel "sheet" roof used only over small multi-bin composting facilities. Anchor to existing facility located under roof. No foundation preparation. Limit maximum area to 1,500 SF. (All others use Timber Frame Roof scenario no. 4.) Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

**After Situation:**

A timber framed stick building with no truss, all supports by individual members with steel "sheet" roof and supporting foundation. Typically a roof over a multi-bin mortallity facility sized at 16' x40'. Limit maximum area to 1,500 SF. Engineered and installed in accordance with appropriate building codes and permits. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

**Feature Measure:** Foot print of building

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 640.00

**Scenario Total Cost:** $13,077.11

**Scenario Cost/Unit:** $20.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 16 | $925.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| **Materials** | | | | | | |
| Corrugated Steel, 22 gauge | 224 | Corrugated or ribbed, galvanized, 22 gauge, includes fasteners, materials only. | Square Feet | $2.52 | 720 | $1,814.40 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 1091 | $2,607.49 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 540 | $2,473.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 5 | $845.70 |

**Practice:** 367 - Roofs and Covers

**Scenario** #4 - Timber Frame Roof

**Scenario Description:**

A timber framed building with a timber or steel "sheet" roof. Anchor to existing facility located under roof or simple supports in ground. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storagg es or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Specificed snowload and deadload on truss is less than 40 PSF. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

**After Situation:**

A timber framed building with a timber or steel "sheet" roof and supporting foundation by asssociated practice. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 5,000 square feet and is over an approved animal waste management facility as a component of a CNMP. Specificed snowload and deadload on truss is 30 PSF. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

**Feature Measure:** Footprint of building

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,000.00

**Scenario Total Cost:** $81,340.35

**Scenario Cost/Unit:** $16.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Roof, Post Frame Building, 30 to 60 ft. wide | 1676 | Post Frame Building, no sides, - 30 to 60 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation. | Square Feet | $16.19 | 5000 | $80,950.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 367 - Roofs and Covers

**Scenario** #5 - Timber Frame Roof, Heavy Snow/High Wind

**Scenario Description:**

A timber framed building with a timber or steel "sheet" roof. Anchor to existing facility located under roof or simple supports in ground. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storagg es or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Specificed snowload and deadload on truss is equal to or greater than 40 PSF or wind loads exceeding 90 mph. These are typically used in high snowfall areas of a county or state or coastal states. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

**After Situation:**

A timber framed building with a timber or steel "sheet" roof and supporting foundation by asssociated practice. Engineered and installed in accordance with appropriate building codes and permits. Truss specified must handle a total combined snow and deadload of 50 PSF or roof system will handle high wind loads. Typical size is 5,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

**Feature Measure:** Footprint of building

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,000.00

**Scenario Total Cost:** $96,890.35

**Scenario Cost/Unit:** $19.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Roof, Post Frame Building, 30 to 60 ft. Wide, Hazardous Condtions | 2512 | Post Frame Building, no sides, - between 30 and 60 ft. width. Hazardous building sites with snow loads exceeding 30 lbs. per square foot and extreme wind exposure in areas of open terrain (flat open areas, grassland, shoreline, etc.). Includes materials, shipping, equipment, and installation. Does not include foundation preparation. | Square Feet | $19.30 | 5000 | $96,500.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 367 - Roofs and Covers

**Scenario** #6 - Timber Frame Roof, complex foundation

**Scenario Description:**

A timber framed building with a timber or steel "sheet" roof and complex supporting foundation. Requires construction of anchor holes with concrete. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Specificed snowload and deadload on truss is less than 40 PSF. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

**After Situation:**

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 5,000 square feet and is over an approved animal waste management facility as a component of a CNMP. Truss specified must handle a total combined snow and deadload of 30 PSF. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

**Feature Measure:** Footprint of building

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,000.00

**Scenario Total Cost:** $85,175.89

**Scenario Cost/Unit:** $17.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 3 | $641.52 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 9 | $57.69 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 16 | $925.60 |
| Auger, Truck Mounted | 2049 | Truck mounted auger for large diameter excavation. Includes equipment and labor. | Hours | $107.79 | 8 | $862.32 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Roof, Post Frame Building, 30 to 60 ft. wide | 1676 | Post Frame Building, no sides, - 30 to 60 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation. | Square Feet | $16.19 | 5000 | $80,950.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 367 - Roofs and Covers

**Scenario** #7 - Timber Frame Roof, Complex found, Heavy Snow/High wind

**Scenario Description:**

A timber framed building with a timber or steel "sheet" roof and complex supporting foundation. Requires construction of anchor holes with concrete. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Specified snowload and deadload on truss is equal to or greater than 40 PSF or wind loads exceed 90 mph. Typically found in areas with high snowloads or coastal states. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

**After Situation:**

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 5,000 square feet and is over an approved animal waste management facility as a component of a CNMP. Truss specified must handle a total combined snow and deadload of 50 PSF or roof system will handle high wind loads. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

**Feature Measure:** Footpring of building

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,000.00

**Scenario Total Cost:** $100,725.89

**Scenario Cost/Unit:** $20.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 3 | $641.52 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 9 | $57.69 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 16 | $925.60 |
| Auger, Truck Mounted | 2049 | Truck mounted auger for large diameter excavation. Includes equipment and labor. | Hours | $107.79 | 8 | $862.32 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Roof, Post Frame Building, 30 to 60 ft. Wide, Hazardous Condtions | 2512 | Post Frame Building, no sides, - between 30 and 60 ft. width. Hazardous building sites with snow loads exceeding 30 lbs. per square foot and extreme wind exposure in areas of open terrain (flat open areas, grassland, shoreline, etc.). Includes materials, shipping, equipment, and installation. Does not include foundation preparation. | Square Feet | $19.30 | 5000 | $96,500.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 367 - Roofs and Covers

**Scenario** #8 - Steel Frame with Roof

**Scenario Description:**

A steel framed building with steel "sheet" roof and simple supporting foundation or provided by associated practice Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

**After Situation:**

A steel framed building with steel "sheet" roof and supporting foundation provided by an associated practice. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 10,000 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

**Feature Measure:** Footprint of building

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 10,000.00

**Scenario Total Cost:** $197,941.82

**Scenario Cost/Unit:** $19.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Roof, Steel Frame Monoslope Building, greater than 60 ft. wide | 1677 | Steel Frame Monoslope Building, greater than 60 ft. width, includes materials, equipment, and installation. Does not include foundation preparation. | Square Feet | $19.73 | 10000 | $197,300.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 367 - Roofs and Covers

**Scenario** #9 - Permeable Composite or Inorganic Cover

**Scenario Description:**

A permeable floating composite cover is deployed on the liquid surface of a waste storage or treatment facility. Permeable covers reduce radiation and wind velocity over the surface of a liquid storage to reduce transmission of odors and act as a medium for growth of microorganisms that utilize carbon, nitrogen, and sulfur to decompose odorous compounds. The permeable composite cover utilizes fabricated shapes or tiles that fit together to cover a minimum of 90% of the liquid surface of a waste storage facility. Associated practices include Waste Storage Facility (313), and Waste Treatment Lagoon (359)

**Before Situation:**

Applicable where an existing or planned animal waste storage or treatment lagoon is creating significant air quality concerns due to odor problems and the release of ammonia as a fine particulate matter precursor. Installation will improve the management of an existing or planned system to control the release of odors as well as ammonia to improve air quality as part of the existing or planned animal waste management system.

**After Situation:**

A permeable modular cover applied to the liquid surface of a waste storage or treatment facility. Installation of the permeable modular cover will improve air quality by reducing emissions of odors and ammonia. The waste storage volume must be documented in the CNMP as adequate to store the waste product and rainfall on the surface of the facility for the intended period without any credit for evaporative loss. Installation of the practice will address air quality by reducing emissions of odors and ammonia. The typical waste storage structure has a liquid surface area of 7,000 square feet.

**Feature Measure:** Storage Surface Area at Normal Ful

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 7,000.00

**Scenario Total Cost:** $21,889.14

**Scenario Cost/Unit:** $3.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 2 | $126.66 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Composite Cover, floating cover, > 5,000 square feet | 1860 | Composite material that is used to cover open storages with an area greater than 5,000 sf. Example, Hexa-Cover. Materials only. | Square Feet | $3.09 | 7000 | $21,630.00 |

**Practice:** 367 - Roofs and Covers

**Scenario** #10 - Flexible Membrane Cover, 20000 or less SF pond surface area

**Scenario Description:**

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion. Includes gas collection and flaring system. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), Pumping Plant (533 ), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned agricultural waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system.

**After Situation:**

A 15,000 SF fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Included will be a collection pipe for methane, a system of weighted tubes to create channels for rainwater collection and also keep membrane tight to surface. Methane collection pipe connected to flare with gas meter, flame arrestor and moisture control. Rainwater removal will be made under Pumping Plant (533). Payment based on surface area at top inside slope.

**Feature Measure:** Surface of Area of Storage Facility

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 15,000.00

**Scenario Total Cost:** $329,874.77

**Scenario Cost/Unit:** $21.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 48 | $307.68 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 32 | $1,851.20 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 24 | $2,268.24 |
| Trencher, 8 in. | 936 | Equipment and power unit costs. Labor not included. | Hours | $49.64 | 8 | $397.12 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 24 | $816.48 |
| **Materials** | | | | | | |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 2170 | $15,819.30 |
| Covered Lagoon Gas Collection System | 1664 | Piping and collection system for biogas. Includes labor and equipment. | Each | $390,000.00 | 0.6 | $234,000.00 |
| Covered Lagoon Flare | 1666 | Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment. | Each | $71,250.00 | 1 | $71,250.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 367 - Roofs and Covers

**Scenario** #11 - Flexible Membrane Cover, 20,001 to 80,000 SF pond surface area

**Scenario Description:**

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion. Includes gas collection and flaring system. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned agricultural waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system.

**After Situation:**

A 50,000 SF fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Included will be a collection pipe for methane, a system of weighted tubes to create channels for rainwater collection and also keep membrane tight to surface. Methane collection pipe connected to flare with gas meter, flame arrestor and moisture control. Rainwater removal will be made under Pumping Plant (533). Payment based on surface area at top inside slope.

**Feature Measure:** Surface of Area of Storage Facility

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 50,000.00

**Scenario Total Cost:** $647,409.41

**Scenario Cost/Unit:** $12.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 90 | $576.90 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 56 | $3,239.60 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 40 | $3,780.40 |
| Trencher, 8 in. | 936 | Equipment and power unit costs. Labor not included. | Hours | $49.64 | 16 | $794.24 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 96 | $3,265.92 |
| **Materials** | | | | | | |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 7200 | $52,488.00 |
| Covered Lagoon Gas Collection System | 1664 | Piping and collection system for biogas. Includes labor and equipment. | Each | $390,000.00 | 1.3 | $507,000.00 |
| Covered Lagoon Flare | 1666 | Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment. | Each | $71,250.00 | 1 | $71,250.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 367 - Roofs and Covers

**Scenario** #12 - Flexible Membrane Cover, 80001 or greater pond surface area

**Scenario Description:**

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion. Includes gas collection and flaring system. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561), Roof Runoff Structure (558), Waste Storage Facility (313), and Waste Treatment (629).

**Before Situation:**

Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned agricultural waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system.

**After Situation:**

A 100,000 SF fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Included will be a collection pipe for methane, a system of weighted tubes to create channels for rainwater collection and also keep membrane tight to surface. Methane collection pipe connected to flare with gas meter, flame arrestor and moisture control. Rainwater removal will be made under Pumping Plant (533). Payment based on surface area at top inside slope.

**Feature Measure:** Surface of Area of Storage Facility

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 100,000.00

**Scenario Total Cost:** $1,059,188.23

**Scenario Cost/Unit:** $10.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 126 | $807.66 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 94 | $5,437.90 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 80 | $7,560.80 |
| Trencher, 8 in. | 936 | Equipment and power unit costs. Labor not included. | Hours | $49.64 | 24 | $1,191.36 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 160 | $5,155.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 208 | $7,076.16 |
| **Materials** | | | | | | |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 14400 | $104,976.00 |
| Covered Lagoon Gas Collection System | 1664 | Piping and collection system for biogas. Includes labor and equipment. | Each | $390,000.00 | 2 | $780,000.00 |
| Covered Lagoon Flare | 1666 | Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment. | Each | $71,250.00 | 2 | $142,500.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #9 - In-House Composting

**Scenario Description:**

This scenario consists the emergency disposal of poultry mortality by composting in a static windrow. The cause of mortatiy is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

**Before Situation:**

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. The typical scenario number of birds to be disposed of is 20,000, 4 pound birds which can be composted in-house. Composting requires 1.5 pounds of carbon per pound of bird. There is 0.5 pounds of litter per bird already on site. Wood chips (45 pcf) will be used as the additional carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 2 add'l laborers: 1) stockpiling birds and litter in center of house; 2) construct 2 windrow bases using carbon material; 3) place carcass/litter mix on bases; 4) cover with carbon material; 5) cap windrows with any remaining litter; 6) after first heat cycle remove windrow from house and reconstruct outside house for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $9,289.85

**Scenario Cost/Unit:** $116.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 28 | $1,619.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 91 | $5,138.77 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 28 | $902.16 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 28 | $952.56 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 4 | $676.56 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #10 - Burial

**Scenario Description:**

This scenario consists of the on-site burial of animal mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 25 head of mature cattle located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 3' additional cover over carcasses. Construct a 6' x 60' (surface dimensions) burial site with appropriate cover. Site can handle mortality for 25 mature beef cattle. On site soils can be re-compacted to meet required imperviousness. Include 3' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $2,780.88

**Scenario Cost/Unit:** $111.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 94 | $341.22 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 12 | $759.96 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 94 | $153.22 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 12 | $408.24 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #116 - Outside Windrow Composting

**Scenario Description:**

This scenario consists the emergency disposal of a large number of livestock mortality by composting in a static windrow. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

**Before Situation:**

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, or interaction with predators.

**After Situation:**

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. This typical scenario was developed based on the composting of 20 head of cattle averaging 1000 pound each which are moved to a location on-site that is suitable for composting. The scenario includes equipment time and labor to recover and transport carcasses to the composting location and the building an turning of the pile at the appropriate time. Composting requires 1.5 pounds of carbon per pound of animal. A small volume of green manure or waste feed is available on site. Wood chips (45 pcf) will be used as the carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 1 add'l laborer: 1) collecting and transporting carcasses to compost site; 2) constructing compost windrow base using carbon material; 3) place carcasses 4) cover carcasses with green manure/waste feed; 4) cover with carbon material; 5) cap windrow with any remaining manure/feed; 6) after first heat cycle turn the windrow over and reconstruct for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $17,843.32

**Scenario Cost/Unit:** $892.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 55 | $3,483.15 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 148 | $8,357.56 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 55 | $1,772.10 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 55 | $1,871.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 18 | $963.18 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 5 | $1,257.35 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #117 - Cattle or Horse Disposal Other Than Burial

**Scenario Description:**

This scenario consists of the disposal of cattle, horse or other similarly sized animal carcasses by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 5 head averaging 1000 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport carcasses to the landfill which is a distance of 35 miles from the farm.

**Feature Measure:** Number of Head

**Scenario Unit:** Each

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $2,351.07

**Scenario Cost/Unit:** $470.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 5 | $316.65 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 8 | $430.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 360 | $36.00 |
| Landfill Fee, Animal Carcass | 2711 | Fees charged by a landfill for proper disposal of animal carcass or animal debris | Cubic Yards | $83.89 | 4 | $335.56 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #118 - Swine Disposal Other Than Burial

**Scenario Description:**

This scenario consists of the disposal of swine or other similarly sized animal carcasses on a small size operation by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 1 boar at 450 pounds, 9 sows at 350 pounds each and 8 babies/sow at 12 pounds each in a landfill. The number of head counted are the sows and boar (adult swine) at 10 total head. The scenario includes materials, equipment time and labor to recover and transport the boar, sows and baby carcasses to the landfill which is a distance of 35 miles from the farm.

**Feature Measure:** Number of Adult Head

**Scenario Unit:** Each

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,795.66

**Scenario Cost/Unit:** $179.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 3 | $189.99 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 6 | $322.68 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| **Materials** | | | | | | |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 308 | $30.80 |
| Landfill Fee, Animal Carcass | 2711 | Fees charged by a landfill for proper disposal of animal carcass or animal debris | Cubic Yards | $83.89 | 3 | $251.67 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #119 - Disposal of Goats or Sheep Other Than Burial

**Scenario Description:**

This scenario consists of the disposal of goat, sheep or other similarly sized animal carcasses on a small size operation by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 10 head of goats at an average weight of 100 pounds each in a landfill. All head are counted. The scenario includes materials, equipment time and labor to recover and transport the goat carcasses to the landfill which is a distance of 35 miles from the farm.

**Feature Measure:** Number of Head

**Scenario Unit:** Each

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,390.92

**Scenario Cost/Unit:** $139.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 2 | $126.66 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 5 | $268.90 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 5 | $249.05 |
| **Materials** | | | | | | |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 270 | $27.00 |
| Landfill Fee, Animal Carcass | 2711 | Fees charged by a landfill for proper disposal of animal carcass or animal debris | Cubic Yards | $83.89 | 1 | $83.89 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #121 - Forced Air Incineration

**Scenario Description:**

This scenario consists the emergency disposal of a large number of livestock by a portable forced air incinerator. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

**After Situation:**

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. This typical scenario was developed based on the forced air incineration of the carcasses of 50 head of cattle averaging 1000 pound each. The scenario includes equipment time and labor to recover and transport carcasses to a suitable on-site incineration location and the rental and operation of a portable forced air incinerator. Wood fuel is also added to assist with the incineration process. The forced air incineration operation consists of a tractor plus operator to collect and transport carcasses to the incineration site, a portable forced air incinerator plus operator, and 1 add'l laborer. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $17,083.50

**Scenario Cost/Unit:** $341.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 50 | $3,166.50 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 42 | $2,371.74 |
| Incinerator, Portable, Trench Burner | 2712 | A portable incinerator used with the development of a trench to incinerate animal carcasses or other debris | Week | $1,297.14 | 2 | $2,594.28 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 50 | $1,611.00 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 94 | $3,197.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 56 | $2,996.56 |
| **Materials** | | | | | | |
| Fuel, propane | 1597 | 20 pound propane bottle, with propane, for ignition of prescribed burns. Materials only. | Each | $14.28 | 45 | $642.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #122 - Disposal At Landfill or Render

**Scenario Description:**

This scenario consists of the disposal of animal mortality carcasses by landfilling or rendering resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 700 finisher swine carcasses at an average weight of 200 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport the carcasses to the landfill which is within a 1.5 hour drive of the farm.

**Feature Measure:** Pounds of mortality

**Scenario Unit:** Pound

**Scenario Typical Size:** 140,000.00

**Scenario Total Cost:** $13,136.19

**Scenario Cost/Unit:** $0.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 5 | $289.25 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 39 | $2,097.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 39 | $1,942.59 |
| **Materials** | | | | | | |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 3388 | $338.80 |
| Landfill Fee, Animal Carcass | 2711 | Fees charged by a landfill for proper disposal of animal carcass or animal debris | Cubic Yards | $83.89 | 91 | $7,633.99 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #182 - National Emergency Shallow Burial of Swine or Cattle

**Scenario Description:**

This scenario consists of the disposal of animal carcasses by burial in a shallow trench resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, and organics being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. This scenario has been written to exclude feathered animals since early research has indicated that feathered animals do not break down quickly using this method. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Fence (384)

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Emergency animal mortalities resulting from causes not related to disease are being buried in a shallow trench,that prevents non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. The is a new method of mortality disposal recommended by APHIS. 50 animal units (50,000 pound) of animal mortality is the maximum allowed for this method. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of livestock animal mortality by burial in an 18 inch deep by 8 foot wide trench. A 12 inch thick layer of carbon material is placed in the bottom of the trench. The carcass is placed in the trench and covered with 4 inches of carbon material. Then the excavated soil is placed over the entire trench area. The scenario includes equipment time and labor to excavate the trench, place carbon layer in the trench bottom, recover and transport carcasses to the shallow burial location, place carcasses in the trench and cover with more carbon and the excavated soil. Wood chips (45 pcf) will be used as the carbon source.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $9,892.09

**Scenario Cost/Unit:** $197.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 4 | $500.44 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 13 | $823.29 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 120 | $6,776.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 13 | $418.86 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 13 | $442.26 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #198 - National Emergency Composting – purchase carbon material and mobilize equipment

**Scenario Description:**

This scenario consists of the disposal of animal carcasses by composting in a static windrow resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, and organics being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Emergency animal mortalities resulting from causes not related to disease are being disposed by composting in a static windrow that prevents non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators. An overall plan covers the disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 30,000 pounds of animal mortality by composting on-site. The scenario includes equipment time and labor to recover and transport carcasses to the composting location and the building and turning of the pile at the appropriate time. Composting requires 5 cubic yards of carbon material per 1000 pounds of animal. Wood chips (45 pcf) will be used as the carbon source.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $16,238.67

**Scenario Cost/Unit:** $541.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 55 | $3,483.15 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 150 | $8,470.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 55 | $1,772.10 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 55 | $1,871.10 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #214 - National Emergency Carcass Disposal Other Than Burial, Incineration, Landfill or Render

**Scenario Description:**

This scenario consists of the disposal of animal carcasses by methods other than burial, incineration, landfill or rendering resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Emergency animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, incineration, landfill or rendering, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of livestock carcasses by composting on-site. The scenario assumes the grower will provide all equipment and labor and that 50% of the carbon for composting is available on-site.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $11,361.60

**Scenario Cost/Unit:** $378.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 55 | $3,483.15 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 75 | $4,235.25 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 55 | $1,772.10 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 55 | $1,871.10 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #230 - National Emergency Disposal At Landfill or Render

**Scenario Description:**

This scenario consists of the disposal of animal mortality carcasses by landfilling or rendering resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a landfill or by rendering, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 700 finisher swine carcasses at an average weight of 200 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport the carcasses to the landfill which is within a 1.5 hour drive of the farm.

**Feature Measure:** Pounds of mortality

**Scenario Unit:** Pound

**Scenario Typical Size:** 140,000.00

**Scenario Total Cost:** $13,136.19

**Scenario Cost/Unit:** $0.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 5 | $289.25 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 39 | $2,097.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 39 | $1,942.59 |
| **Materials** | | | | | | |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 3388 | $338.80 |
| Landfill Fee, Animal Carcass | 2711 | Fees charged by a landfill for proper disposal of animal carcass or animal debris | Cubic Yards | $83.89 | 91 | $7,633.99 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #246 - National Emergency In-House Composting

**Scenario Description:**

This scenario consists the emergency disposal of poultry mortality by composting in a static windrow resulting from impacts related to the National Emergency. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

**Before Situation:**

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Animal mortality disposal is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. The typical scenario consists of in-house composting of animal mortality. Composting requires 1.5 pounds of carbon per pound of mortatility. There is some manure and bedding already on site. Wood chips (45 pcf) will be used as the additional carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 2 add'l laborers: 1) stockpiling carcasses, bedding, and manure in center of house; 2) construct 2 windrow bases using carbon material; 3) place carcass/bedding/manure mix on bases; 4) cover with carbon material; 5) cap windrows with any remaining bedding/manure; 6) after first heat cycle remove windrow from house and reconstruct outside house for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $9,428.73

**Scenario Cost/Unit:** $117.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 28 | $1,619.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 91 | $5,138.77 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 28 | $902.16 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 28 | $952.56 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 4 | $676.56 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #262 - National Emergency Forced Air Incineration

**Scenario Description:**

This scenario consists the emergency disposal of a large number of livestock resulting from impacts related to the National Emergency. The cause of mortatiy is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. An overall plan covers normal and catastrophic mortality events. This typical scenario was developed based on the forced air incineration of 50 animal units of livestock carcasses. The scenario includes equipment time and labor to recover and transport carcasses to a suitable on-site incineration location and the rental and operation of a portable forced air incinerator. Wood fuel is also added to assist with the incineration process. The forced air incineration operation consists of a tractor plus operator to collect and transport carcasses to the incineration site, a portable forced air incinerator plus operator, and 1 add'l laborer. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area. The forced air incineration operation consists of a tractor plus operator to collect and transport carcasses to the incineration site, a portable forced air incinerator plus operator, and 1 add'l laborer. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $17,083.50

**Scenario Cost/Unit:** $341.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 50 | $3,166.50 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 42 | $2,371.74 |
| Incinerator, Portable, Trench Burner | 2712 | A portable incinerator used with the development of a trench to incinerate animal carcasses or other debris | Week | $1,297.14 | 2 | $2,594.28 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 50 | $1,611.00 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 94 | $3,197.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 56 | $2,996.56 |
| **Materials** | | | | | | |
| Fuel, propane | 1597 | 20 pound propane bottle, with propane, for ignition of prescribed burns. Materials only. | Each | $14.28 | 45 | $642.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #278 - National Emergency Burial

**Scenario Description:**

This scenario consists of the on-site burial of animal mortalities resulting from impacts related to the National Emergency. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

**After Situation:**

Catastrophic Animal mortalities resultuing from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 25 head of mature cattle located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 3' additional cover over carcasses. Construct a 6' x 60' (surface dimensions) burial site with appropriate cover. Site can handle mortality for 25 mature beef cattle. On site soils can be recompacted to meet required imperviousness. Include 3' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of 1000 lbs Animal Units

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $2,780.88

**Scenario Cost/Unit:** $111.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 94 | $341.22 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 12 | $759.96 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 94 | $153.22 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 12 | $408.24 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #289 - Burial of Cattle or Horses

**Scenario Description:**

This scenario consists of the on-site burial of cattle or horse mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of 5 head averaging 1000 pounds each located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 2' additional cover over carcasses. Construct a 16'W x 32'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of head

**Scenario Unit:** Each

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $2,251.77

**Scenario Cost/Unit:** $450.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 78 | $283.14 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 5 | $316.65 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #290 - Burial of Swine

**Scenario Description:**

This scenario consists of the on-site burial of swine or other similarly sized animal mortalities on a small size operation resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the burial of 1 boar at 450 pounds, 9 sows at 350 pounds each and 8 babies/sow at 12 pounds each in a landfill. The number of head counted are the sows and boar (adult swine) at 10 total head. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 2' additional cover over carcasses. Construct a 16'W x 52'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of Adult Head

**Scenario Unit:** Each

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,886.37

**Scenario Cost/Unit:** $188.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 78 | $283.14 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 3 | $189.99 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 40 | $65.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 368 - Emergency Animal Mortality Management

**Scenario** #291 - Burial of Goat or Sheep

**Scenario Description:**

This scenario consists of the on-site burial of goat, sheep or other similarly sized animal mortalities on a small size operation resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

**Before Situation:**

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

**After Situation:**

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events. This typical scenario was developed based on the burial of 10 head of 100 pound average weight goats. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 3' deep plus 2' additional cover over carcasses. Construct a 12'W x 29'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

**Feature Measure:** Number of Head

**Scenario Unit:** Each

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,506.33

**Scenario Cost/Unit:** $150.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 30 | $108.90 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 2 | $126.66 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 13 | $21.19 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #1 - IC Engine Repower, < 50 bhp

**Scenario Description:**

Older diesel engine replaced with new diesel engine repower (30 hp). The existing diesel engine may be stationary or portable operating an irrigation pump or an auxiliary engine providing mechanical function for agricultural/forestry equipment. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations. Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well, CAP 126 Comprehensive Air Quality Management Plan, CAP 122 Agricultural Energy Management Plan - Headquarters, and CAP 124 Agricultural Energy Management Plan - Landscape.

**Before Situation:**

An old or inefficient diesel engine powers an irrigation pumping plant or grain dryer fan, or is a backup power generation for a farming operation. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR the existing diesel engine is energy inefficient due to a conversion of the irrigation system, reduction in required pump capacity, or age of the power unit. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to operate an existing irrigation pump, off-road agricultural vehicle or other auxillary engine providing a mechanical function for agricultural/forestry equipment.

**After Situation:**

The repowered diesel engine (30 hp) replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. For Air Quality: The repower diesel engine will be cleaner-burning and will emit less particulate matter and/or oxides of nitrogen than the previous existing engine. For Energy: Energy efficiency will be improved by at least 20%; the increase in energy efficiency for the modified unit must be supported by an energy analysis.

**Feature Measure:** Size of Replacement Engine

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $3,137.48

**Scenario Cost/Unit:** $104.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Motor, IC Engine, 25-49 HP | 1428 | Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 25 to 49 bhp. Materials only. | Horsepower | $90.94 | 30 | $2,728.20 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #2 - IC Engine Repower, 50-99 bhp

**Scenario Description:**

Older diesel engine replaced with new diesel engine repower (75 hp). The existing diesel engine may be stationary or portable operating an irrigation pump or an auxiliary engine providing mechanical function for agricultural/forestry equipment. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations. Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well, CAP 126 Comprehensive Air Quality Management Plan, CAP 122 Agricultural Energy Management Plan - Headquarters, and CAP 124 Agricultural Energy Management Plan - Landscape.

**Before Situation:**

An old or inefficient diesel engine powers an irrigation pumping plant or grain dryer fan, or is a backup power generation for a farming operation. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR the existing diesel engine is energy inefficient due to a conversion of the irrigation system, reduction in required pump capacity, or age of the power unit. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to operate an existing irrigation pump, off-road agricultural vehicle or other auxillary engine providing a mechanical function for agricultural/forestry equipment.

**After Situation:**

The repowered diesel engine (75 hp) replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. For Air Quality: The repower diesel engine will be cleaner-burning and will emit less particulate matter and/or oxides of nitrogen than the previous existing engine. For Energy: Energy efficiency will be improved by at least 20%; the increase in energy efficiency for the modified unit must be supported by an energy analysis.

**Feature Measure:** Size of Replacement Engine

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 75.00

**Scenario Total Cost:** $14,603.56

**Scenario Cost/Unit:** $194.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Motor, IC Engine, 50-99 HP | 1429 | Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 50 to 99 bhp. Materials only. | Horsepower | $183.80 | 75 | $13,785.00 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #3 - IC Engine Repower, 100-199 bhp

**Scenario Description:**

Older diesel engine replaced with new diesel engine repower (150 hp). The existing diesel engine may be stationary or portable operating an irrigation pump or an auxiliary engine providing mechanical function for agricultural/forestry equipment. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations. Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well, CAP 126 Comprehensive Air Quality Management Plan, CAP 122 Agricultural Energy Management Plan - Headquarters, and CAP 124 Agricultural Energy Management Plan - Landscape.

**Before Situation:**

An old or inefficient diesel engine powers an irrigation pumping plant or grain dryer fan, or is a backup power generation for a farming operation. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR the existing diesel engine is energy inefficient due to a conversion of the irrigation system, reduction in required pump capacity, or age of the power unit. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to operate an existing irrigation pump, off-road agricultural vehicle or other auxillary engine providing a mechanical function for agricultural/forestry equipment.

**After Situation:**

The repowered diesel engine (150 hp) replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. For Air Quality: The repower diesel engine will be cleaner-burning and will emit less particulate matter and/or oxides of nitrogen than the previous existing engine. For Energy: Energy efficiency will be improved by at least 20%; the increase in energy efficiency for the modified unit must be supported by an energy analysis.

**Feature Measure:** Size of Replacement Engine

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 150.00

**Scenario Total Cost:** $24,392.56

**Scenario Cost/Unit:** $162.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Motor, IC Engine, 100-199 HP | 1430 | Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 100 to 199 bhp. Materials only. | Horsepower | $157.16 | 150 | $23,574.00 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #5 - Electric Motor in-lieu of IC Engine, < 12 HP

**Scenario Description:**

Replace an existing IC engine operating an irrigation well with a new electric motor (10 HP). An existing IC engine is stationary or portable (does not propel a vehicle and is not an auxiliary IC engine on a vehicle). This replacement provides the greatest emission reductions by eliminating NOx, VOC, and PM emissions from the source. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations. Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well, CAP 126 Comprehensive Air Quality Management Plan, CAP 122 Agricultural Energy Management Plan - Headquarters, and CAP 124 Agricultural Energy Management Plan - Landscape.

**Before Situation:**

Irrigation pump with IC engine withdraws water from a well and provides water through a center pivot irrigation system. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR based on an evaluation of the engine, the pump, the well, and the center pivot irrigation system, the engine is less than 50 percent efficient in delivering water to the system. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to operate an existing irrigation pump. Plant Condition Impact: Poor plant condition and vigor is evident due to a lack of water during critical times in the growing season. Water Quality Impacts: Fuel tank and fuel line have potential to cause environmental damage with leaks. The existing internal combustion engine is inefficient in delivering water to the system; subsequently, the lack of plant growth and uptake of nutrients, nitrogen and phosphorus are not being fully utilized and are available to be lost to surface and ground waters.

**After Situation:**

The 10 HP electric motor replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. For Air Quality: The electric motor does not produce any on-farm emissions of oxides of nitrogen or particulate matter, resulting in a substantial emissions reduction on the farm. For Energy: Energy efficiency will be improved by at least 20%. For Plant Condition: Plant condition and vigor will be improved. For Water Quality: The potential for environmental damage due to leaks from the tanks and fuel lines has been eliminated. Plant uptake of available nutrients will be increased and less nutrients will be lost to surface and ground waters.

**Feature Measure:** Number of Combustion Units Repla

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,833.31

**Scenario Cost/Unit:** $1,833.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 10 HP | 1172 | Premium NEMA approved electric motor, 10 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $1,424.03 | 1 | $1,424.03 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #6 - Electric Motor in-lieu of IC Engine, 12-74 HP

**Scenario Description:**

Replace an existing IC engine operating an irrigation well with a new electric motor (50 HP). An existing IC engine is stationary or portable (does not propel a vehicle and is not an auxiliary IC engine on a vehicle). This replacement provides the greatest emission reductions by eliminating NOx, VOC, and PM emissions from the source. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations. Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well, CAP 126 Comprehensive Air Quality Management Plan, CAP 122 Agricultural Energy Management Plan - Headquarters, and CAP 124 Agricultural Energy Management Plan - Landscape.

**Before Situation:**

Irrigation pump with IC engine withdraws water from a well and provides water through a center pivot irrigation system. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR based on an evaluation of the engine, the pump, the well, and the center pivot irrigation system, the engine is less than 50 percent efficient in delivering water to the system. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to operate an existing irrigation pump. Plant Condition Impact: Poor plant condition and vigor is evident due to a lack of water during critical times in the growing season. Water Quality Impacts: Fuel tank and fuel line have potential to cause environmental damage with leaks. The existing internal combustion engine is inefficient in delivering water to the system; subsequently, the lack of plant growth and uptake of nutrients, nitrogen and phosphorus are not being fully utilized and are available to be lost to surface and ground waters.

**After Situation:**

The 50 HP electric motor replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. For Air Quality: The electric motor does not produce any on-farm emissions of oxides of nitrogen or particulate matter, resulting in a substantial emissions reduction on the farm. For Energy: Energy efficiency will be improved by at least 20%. For Plant Condition: Plant condition and vigor will be improved. For Water Quality: The potential for environmental damage due to leaks from the tanks and fuel lines has been eliminated. Plant uptake of available nutrients will be increased and less nutrients will be lost to surface and ground waters.

**Feature Measure:** Number of Combustion Units Repla

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,590.79

**Scenario Cost/Unit:** $6,590.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 50 HP | 1173 | Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $5,976.87 | 1 | $5,976.87 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #7 - Electric Motor in-lieu of IC Engine, 75-149 HP

**Scenario Description:**

Replace an existing IC engine operating an irrigation well with a new electric motor (100 HP). An existing IC engine is stationary or portable (does not propel a vehicle and is not an auxiliary IC engine on a vehicle). This replacement provides the greatest emission reductions by eliminating NOx, VOC, and PM emissions from the source. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations. Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well, CAP 126 Comprehensive Air Quality Management Plan, CAP 122 Agricultural Energy Management Plan - Headquarters, and CAP 124 Agricultural Energy Management Plan - Landscape.

**Before Situation:**

Irrigation pump with IC engine withdraws water from a well and provides water through a center pivot irrigation system. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR based on an evaluation of the engine, the pump, the well, and the center pivot irrigation system, the engine is less than 50 percent efficient in delivering water to the system. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to operate an existing irrigation pump. Plant Condition Impact: Poor plant condition and vigor is evident due to a lack of water during critical times in the growing season. Water Quality Impacts: Fuel tank and fuel line have potential to cause environmental damage with leaks. The existing internal combustion engine is inefficient in delivering water to the system; subsequently, the lack of plant growth and uptake of nutrients, nitrogen and phosphorus are not being fully utilized and are available to be lost to surface and ground waters.

**After Situation:**

The 100 HP electric motor replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. For Air Quality: The electric motor does not produce any on-farm emissions of oxides of nitrogen or particulate matter, resulting in a substantial emissions reduction on the farm. For Energy: Energy efficiency will be improved by at least 20%. For Plant Condition: Plant condition and vigor will be improved. For Water Quality: The potential for environmental damage due to leaks from the tanks and fuel lines has been eliminated. Plant uptake of available nutrients will be increased and less nutrients will be lost to surface and ground waters.

**Feature Measure:** Number of Combustion Units Repla

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,205.34

**Scenario Cost/Unit:** $12,205.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 100 HP | 1174 | Premium NEMA approved electric motor, 100 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $11,386.78 | 1 | $11,386.78 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #8 - Electric Motor in-lieu of IC Engine, 150-299 HP

**Scenario Description:**

Replace an existing IC engine operating an irrigation well with a new electric motor (200 HP). An existing IC engine is stationary or portable (does not propel a vehicle and is not an auxiliary IC engine on a vehicle). This replacement provides the greatest emission reductions by eliminating NOx, VOC, and PM emissions from the source. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations. Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well, CAP 126 Comprehensive Air Quality Management Plan, CAP 122 Agricultural Energy Management Plan - Headquarters, and CAP 124 Agricultural Energy Management Plan - Landscape.

**Before Situation:**

Irrigation pump with IC engine withdraws water from a well and provides water through a center pivot irrigation system. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR based on an evaluation of the engine, the pump, the well, and the center pivot irrigation system, the engine is less than 50 percent efficient in delivering water to the system. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to operate an existing irrigation pump. Plant Condition Impact: Poor plant condition and vigor is evident due to a lack of water during critical times in the growing season. Water Quality Impacts: Fuel tank and fuel line have potential to cause environmental damage with leaks. The existing internal combustion engine is inefficient in delivering water to the system; subsequently, the lack of plant growth and uptake of nutrients, nitrogen and phosphorus are not being fully utilized and are available to be lost to surface and ground waters.

**After Situation:**

The 200 HP electric motor replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. For Air Quality: The electric motor does not produce any on-farm emissions of oxides of nitrogen or particulate matter, resulting in a substantial emissions reduction on the farm. For Energy: Energy efficiency will be improved by at least 20%. For Plant Condition: Plant condition and vigor will be improved. For Water Quality: The potential for environmental damage due to leaks from the tanks and fuel lines has been eliminated. Plant uptake of available nutrients will be increased and less nutrients will be lost to surface and ground waters.

**Feature Measure:** Number of Combustion Units Repla

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $24,240.51

**Scenario Cost/Unit:** $24,240.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 200 HP | 1175 | Premium NEMA approved electric motor, 200 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $22,194.11 | 1 | $22,194.11 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #9 - Electric Motor in-lieu of IC Engine, >=200 HP

**Scenario Description:**

Replace an existing IC engine operating an irrigation well with a new electric motor (400 HP). An existing IC engine is stationary or portable (does not propel a vehicle and is not an auxiliary IC engine on a vehicle). This replacement provides the greatest emission reductions by eliminating NOx, VOC, and PM emissions from the source. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations. Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well, CAP 126 Comprehensive Air Quality Management Plan, CAP 122 Agricultural Energy Management Plan - Headquarters, and CAP 124 Agricultural Energy Management Plan - Landscape.

**Before Situation:**

Irrigation pump with IC engine withdraws water from a well and provides water through a center pivot irrigation system. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR based on an evaluation of the engine, the pump, the well, and the center pivot irrigation system, the engine is less than 50 percent efficient in delivering water to the system. Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion engine uses excess fuel to operate an existing irrigation pump. Plant Condition Impact: Poor plant condition and vigor is evident due to a lack of water during critical times in the growing season. Water Quality Impacts: Fuel tank and fuel line have potential to cause environmental damage with leaks. The existing internal combustion engine is inefficient in delivering water to the system; subsequently, the lack of plant growth and uptake of nutrients, nitrogen and phosphorus are not being fully utilized and are available to be lost to surface and ground waters.

**After Situation:**

The 400 HP electric motor replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. For Air Quality: The electric motor does not produce any on-farm emissions of oxides of nitrogen or particulate matter, resulting in a substantial emissions reduction on the farm. For Energy: Energy efficiency will be improved by at least 20%. For Plant Condition: Plant condition and vigor will be improved. For Water Quality: The potential for environmental damage due to leaks from the tanks and fuel lines has been eliminated. Plant uptake of available nutrients will be increased and less nutrients will be lost to surface and ground waters.

**Feature Measure:** Number of Combustion Units Repla

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $47,150.40

**Scenario Cost/Unit:** $47,150.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 400 to 499 hp | 1439 | Premium NEMA approved Electric Motor and required appurtenances. 400 to 499 hp (296 - 372 kW). Includes materials and shipping only. | Horsepower | $112.76 | 400 | $45,104.00 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #1 - Water Application - Once per Day

**Scenario Description:**

Application of water as a dust suppressant once per day to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled three times per year. Water is applied via truck once per day as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application of water. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $2,486.44

**Scenario Cost/Unit:** $1.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 132.7 | $802.84 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 10 | $1,683.60 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #2 - Water Application - Twice per Day

**Scenario Description:**

Application of water as a dust suppressant twice per day to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled three times per year. Water is applied via truck twice per day as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application of water. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $3,289.88

**Scenario Cost/Unit:** $1.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 265.5 | $1,606.28 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 10 | $1,683.60 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #3 - Water Application - Once per Week

**Scenario Description:**

Application of water as a dust suppressant once per week to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled three times per year. Water is applied via truck once per week as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application of water. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $1,797.95

**Scenario Cost/Unit:** $1.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 18.9 | $114.35 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 10 | $1,683.60 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #4 - Petroleum-Based Road Oil Application - Once per Year

**Scenario Description:**

Application of a petroleum-based road oil as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled once per year. Petroleum-based road oil is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $5,611.03

**Scenario Cost/Unit:** $3.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.36 | $2.18 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 5 | $841.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 5 | $249.05 |
| **Materials** | | | | | | |
| Chemical, dust control, road oil, petroleum-based | 1339 | Petroleum-based road oil, such as SC-250 or SC-800. Includes materials and shipping only. | Gallons | $5.02 | 900 | $4,518.00 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #5 - Hygroscopic Salt Application - Once per Year

**Scenario Description:**

Application of a hygroscopic salt (calcium chloride, magnesium chloride, sodium chloride, etc.) as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled once per year. Hygroscopic salt solution is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. Once the dust suppressant is applied, the treated surface is compacted. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $2,476.45

**Scenario Cost/Unit:** $1.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.36 | $2.18 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 2 | $41.80 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 5 | $841.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 7 | $348.67 |
| **Materials** | | | | | | |
| Chemical, dust control, hygroscopic salt solution | 1340 | Hygroscopic salt solution, such as calcium chloride, magnesium chloride, or sodium chloride. Materials only. | Gallons | $1.38 | 900 | $1,242.00 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #6 - Lignosulfonate Application - Once per Year

**Scenario Description:**

Application of an adhesive (i.e., lignosulfonate) as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled once per year. An adhesive, such as lignosulfonate, is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. Once the dust suppressant is applied, the treated surface is compacted. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $7,957.45

**Scenario Cost/Unit:** $4.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.36 | $2.18 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 2 | $41.80 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 5 | $841.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 7 | $348.67 |
| **Materials** | | | | | | |
| Chemical, dust control, adhesive, lignosulfonate | 1341 | Adhesive, such as lignosulfonate. Includes materials and shipping only. | Gallons | $7.47 | 900 | $6,723.00 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #7 - Petroleum Emulsion Application - Once per Year

**Scenario Description:**

Application of a petroleum emulsion as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled once per year. A petroleum emulsion is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. Once the dust suppressant is applied, the treated surface is compacted. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $5,122.45

**Scenario Cost/Unit:** $2.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.36 | $2.18 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 2 | $41.80 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 5 | $841.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 7 | $348.67 |
| **Materials** | | | | | | |
| Chemical, dust control, petroleum emulsion | 1342 | Petroleum emulsion. Includes materials and shipping only. | Gallons | $4.32 | 900 | $3,888.00 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #8 - Polymer Emulsion Application - Once per Year

**Scenario Description:**

Application of a polymer emulsion, such as polyacrylamide (PAM), as a dust suppressant once per year to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled once per year. A polymer emulsion is applied via truck once per year as a dust suppressant to the unpaved surface with a minimization of overlap and avoidance of over-application. Once the dust suppressant is applied, the treated surface is compacted. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 450 - Anionic Polyacrylamide (PAM) Application, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $7,381.45

**Scenario Cost/Unit:** $4.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.36 | $2.18 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 2 | $41.80 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 5 | $841.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 7 | $348.67 |
| **Materials** | | | | | | |
| Chemical, dust control, polymer emulsion, tanker purchase | 1343 | Polymer emulsion, such as polyacrylamide purchased in bulk. Includes materials and shipping only. | Gallons | $6.83 | 900 | $6,147.00 |

**Practice:** 373 - Dust Control on Unpaved Roads and Surfaces

**Scenario** #9 - Clay Additive Application - Once per Year

**Scenario Description:**

Application of a clay additive as a dust suppressant once per 5 years to an unpaved road or other unpaved surface where vehicle or wind action may result in emissions of particulate matter without treatment. The specific resource concern to be addressed is "Emissions of Particulate Matter (PM) and PM Precursors".

**Before Situation:**

The operation does not apply a dust suppressant to an unpaved surface. Vehicle or wind action on the untreated unpaved surface results in emissions of particulate matter that cause nuisance dusting or visibility-impairment effects.

**After Situation:**

The unpaved surface is graded and potholes are filled prior to the application. A clay additive is applied once per 5 years as a dust suppressant to the unpaved surface and mixed into the surface with a water application and road grading or other mechanical mixing. This scenario assumes a treated area of 1/4 mile in length and 12 feet in width. Associated practices include 560 - Access Road, 472 - Access Control, 561 - Heavy Use Area Protection, 342 - Critical Area Planting, 635 - Vegetated Treatment Area, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 516 - Pipeline, 533 - Pumping Plant, 449 - Irrigation Water Management, 484 - Mulching, and 380 - Windbreak/Shelterbelt Establishment.

**Feature Measure:** Area Treated

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 1,760.00

**Scenario Total Cost:** $45,830.74

**Scenario Cost/Unit:** $26.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.36 | $2.18 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 8 | $1,346.88 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $34.44 | 1280 | $44,083.20 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #1 - Ventilation - Exhaust

**Scenario Description:**

Replacement of a conventional exhaust fan with high volume, low speed, efficient exhaust fan. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. Practice certification will be through receipts and pictures from the applicant. Typical scenario includes the replacement of a 48" fan.

**Before Situation:**

Inefficient ventilation in an agricultural building.

**After Situation:**

High-efficiency ventilation system which reduces energy use. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,306.44

**Scenario Cost/Unit:** $2,306.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| **Materials** | | | | | | |
| Fan, exhaust, 48 in. High Efficiency | 1187 | 48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only. | Each | $2,152.96 | 1 | $2,152.96 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #2 - Ventilation - HAF

**Scenario Description:**

A system of fans are installed to create a horizontal air circulation pattern; the new system promotes efficient heat and moisture distribution. In a typical 10,000 square foot greenhouse, 10 HAF fans are needed. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs.

**Before Situation:**

Inefficent air circulation system in a greenhouse.

**After Situation:**

High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $308.30

**Scenario Cost/Unit:** $308.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| **Materials** | | | | | | |
| Fan, HAF, 1/10 to 1/15 HP | 1189 | High efficiency Horizontal Air Flow (HAF) fan, controls, wiring, and associated appurtenances. Materials only. | Each | $205.98 | 1 | $205.98 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #3 - Refrig-Plate Cooler-Small

**Scenario Description:**

The installation of all stainless steel dual pass plate cooler, type 316 stainless steel to pre-milk prior to entering bulktank. Practice installation will be by a factory trained dairy techician and according manufacturer's specifications. After installation, energy is saved by a reduction in compresor usage to cool milk. Installation and certification typically by a certified dairy manufacture representative. Associated Practices: AgEMP CAP 122

**Before Situation:**

Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

**After Situation:**

High-efficiency milk cooling system which reduces energy use. The new milk plate cooling equipment < 499 gal.hour ( typically rated at 300 gallon/hour) will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,320.34

**Scenario Cost/Unit:** $5,320.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Plate Cooler, <= 499 gal/hr capacity | 1176 | Stainless Steel, dual pass plate cooler with < 499 gallon/hour capacity. Includes materials and shipping only. | Each | $4,911.06 | 1 | $4,911.06 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #4 - Refrig-Plate Cooler-Med

**Scenario Description:**

The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. After installation, energy is saved by a reduction in compresor usage to cool milk. Installation and certification typically by a certified dairy manufacture representative.

Associated Practices: AgEMP CAP 122

**Before Situation:**

Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

**After Situation:**

High-efficiency milk cooling system which reduces energy use. The new milk plate cooling equipment 500-749 gal/hour( typically rated at 600 gallon/hour) will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $15,954.88

**Scenario Cost/Unit:** $15,954.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Plate Cooler, 500 - 749 gal/hr capacity | 1177 | Stainless Steel, dual pass plate cooler with 500 - 749 gallon/hour capacity. Includes materials and shipping only. | Each | $15,545.60 | 1 | $15,545.60 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #5 - Plate Cooler-lg

**Scenario Description:**

The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. After installation, energy is saved by a reduction in compresor usage to cool milk. Installation and certification typically by a certified dairy manufacture representative.

Associated Practices: AgEMP CAP 122

**Before Situation:**

Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

**After Situation:**

High-efficiency milk cooling system which reduces energy use. The new milk plate cooling equipment rated 750-900 gal/hour (typically 800 gallons/hour ) will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $36,404.10

**Scenario Cost/Unit:** $36,404.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Plate Cooler, 750 - 999 gal/hr capacity | 1178 | Stainless Steel, dual pass plate cooler with 750 - 999 gallon/hour capacity. Includes materials and shipping only. | Each | $35,994.82 | 1 | $35,994.82 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #6 - Scroll Compressor

**Scenario Description:**

Install a new scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Typical scenario includes a new 5 horsepower scroll compressor. Associated Practices: AgEMP CAP 122

**Before Situation:**

Inefficient reciprocating compressor as a key component of the refrigeration system used to cool milk. The compressor is a critical part of a milk cooling system, affecting milk quality, system reliability, and system efficiency.

**After Situation:**

A more efficient scroll compressor, which will reduce energy use, is evidenced by the energy audit. A comparably sized scroll compressor provides refrigeration capacity at a higher efficiency than a reciprocating compressor. Newer scroll compressor systems typically reduce electricity use by 15 to 25 percent compared to reciprocating compressors. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Number of compressors

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,850.83

**Scenario Cost/Unit:** $3,850.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| **Materials** | | | | | | |
| Scroll Compressor - 5 HP | 1183 | Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only. | Each | $3,646.19 | 1 | $3,646.19 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #7 - Water Heater

**Scenario Description:**

Install an Efficient Proprane Water Heater to replace an inefficient water heater or water heating system. Replacement based on results from a Type 2 energy audit meeting the requirements of ASABE S612.

**Before Situation:**

Inefficient Water Heater or water heating system.

**After Situation:**

Replaced inefficient water heater with modern energy efficient water heater. Reduction in energy usage associated with heating water. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,374.07

**Scenario Cost/Unit:** $4,374.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Water Heater, High Efficiency | 2485 | Water heater with efficiency rating as per ASABE-S612. Includes materials and shipping only. | Each | $3,707.03 | 1 | $3,707.03 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #8 - Variable Speed Drive, no motor

**Scenario Description:**

The typical scenario consists of a variable speed drive (VSD) and appurtances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. attached to a 3-phase electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. Non 3-phase motors must be replaced. Cost share seperately on appropriate sized motor upgrade. Associated Practices: AgEMP CAP 122

**Before Situation:**

The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Non 3-phase motors must be replaced. Appropriate sized motor upgrade is paid separately. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** HP of VFD

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $6,736.28

**Scenario Cost/Unit:** $134.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Variable Speed Drive, 50 HP | 1288 | Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only. | Horsepower | $126.54 | 50 | $6,327.00 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #9 - Automatic Controller System

**Scenario Description:**

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

**Before Situation:**

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each system

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,464.73

**Scenario Cost/Unit:** $2,464.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Switches and Controls, temp sensors | 1192 | Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $697.95 | 1 | $697.95 |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $528.75 | 1 | $528.75 |
| Switches and Controls, Wi-Fi system and software | 1194 | Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems | Each | $828.75 | 1 | $828.75 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #10 - Motor Upgrade > 100 HP

**Scenario Description:**

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 100 horsepower.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Number of motors

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $23,012.67

**Scenario Cost/Unit:** $23,012.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 200 HP | 1175 | Premium NEMA approved electric motor, 200 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $22,194.11 | 1 | $22,194.11 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #11 - Motor Upgrade 10 - 100 HP

**Scenario Description:**

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is equal to or larger than 10 and less than or equal to 100 horsepower.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Number of motors

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,386.15

**Scenario Cost/Unit:** $6,386.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 50 HP | 1173 | Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $5,976.87 | 1 | $5,976.87 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #12 - Motor Upgrade > 1 and < 10 HP

**Scenario Description:**

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 1 and less than 10 horsepower.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Number of motors

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,182.65

**Scenario Cost/Unit:** $1,182.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 5 HP | 1171 | Premium NEMA approved electric motor, 5 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $978.01 | 1 | $978.01 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #13 - Motor Upgrade <= 1 HP

**Scenario Description:**

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is less than or equal to 1 horsepower.

**Before Situation:**

The system is inefficient with a standard efficiency motor.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Number of motors

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $813.85

**Scenario Cost/Unit:** $813.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| **Materials** | | | | | | |
| Motor, electric, NEMA Premium, 1 HP | 1169 | Premium NEMA approved electric motor, 1 Horsepower and all required appurtenances. Includes materials and shipping only. | Each | $609.21 | 1 | $609.21 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #14 - Heating - Radiant Tube

**Scenario Description:**

Replace "pancake" Brood Heaters in a poultry house with Radiant Tube Heaters, or similar. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as evidenced by the energy audit. The typical scenario consists of the replacement of 28 brood heaters with 6 radiant tube heaters.

**Before Situation:**

Inefficient heat distribution equipment, such as conventional "pancake" brood heaters. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder. A large number of brooders are required to cover a significant percent of floor space. As the warmed air naturally rises it loses effectiveness for poultry on the ground.

**After Situation:**

Energy use is reduced through installation of a more efficient heater. Radiant tube heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant sytems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a convential pancake brooder. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Number of heaters

**Scenario Unit:** Each

**Scenario Typical Size:** 6.00

**Scenario Total Cost:** $11,257.78

**Scenario Cost/Unit:** $1,876.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Heater, radiant tube | 1163 | Radiant tube heater rated at 125,000 BTU/hour. Materials only. | Each | $1,739.87 | 6 | $10,439.22 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #15 - Heating (Building)

**Scenario Description:**

Replace existing low efficiency heaters with new high efficiency heaters. High-efficiency heating systems include any heating unit with efficiency rating of 80%+ for fuel oil and 90%+ for natural gas and propane. Applications may be air heating/building environment and hydronic (boiler) heating for agricultural operations, including under bench, or root zone heating. An alternative to heater replacement might be the addition of climate control system and electronic temperature controls with +/- 1 degree F differential, to reduce the annual run time.

**Before Situation:**

Buildings heated with low efficiency heaters or heaters without proper electronic climate controls

**After Situation:**

Higher efficiency heaters reduce energy consumption, energy costs, and GHG emissions. These replacement systems can be fueled by natural gas, propane, or fuel oil. Associated practices/activities: 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Rated Heat Output

**Scenario Unit:** 1,000 BTU/Hour

**Scenario Typical Size:** 750.00

**Scenario Total Cost:** $18,998.56

**Scenario Cost/Unit:** $25.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Heater, high efficiency | 1165 | Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only. | 1,000 BTU/Hour | $24.24 | 750 | $18,180.00 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #16 - Heating - Attic Heat Recovery vents

**Scenario Description:**

Install actuated inlets or automatic latching gravity inlets that draw warmer, drier air from the attic to assist with moisture and heat control when ventiliation fans are being operated in poultry houses and swine barns. Other systems to transfer heat, as detailed in ASABE S612-compliant energy audit may also be used. Based on a 40' x 500' poultry house.

**Before Situation:**

Heated buildings with attic spaces but no means to transfer heat between the heated space, attic, and ambient (outside) air when relative conditions allow for reduced energy use.

**After Situation:**

Attic vents or inlets allow dry warm air from the attic to cirulated through out the building. By using pre-warmed air from the attic less energy is needed for heating 122-AgEMP - HQ and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Number of inlets

**Scenario Unit:** Each

**Scenario Typical Size:** 14.00

**Scenario Total Cost:** $3,606.30

**Scenario Cost/Unit:** $257.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| **Materials** | | | | | | |
| Inlet, Attic Ceiling | 2414 | Poultry house attic air inlets. Includes materials only. | Each | $169.89 | 14 | $2,378.46 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #17 - Grain Dryer

**Scenario Description:**

A replacement continuous dryer rated for an appropriatle rated bushel/per hour capacity for the operation that includes a microcomputer-based control system that adjusts the amount of time the crop remains in the dryer in order to achieve a consistent and accurate moisture content in the dried product. Alternate types of replacement dryers which reduce energy use are acceptable as evidenced by the energy audit. The typical operation requires a rated capacity of 860 bushels per hour.

**Before Situation:**

Wet crop is loaded in the top of a horizontal, continuous dryer. Dried crop is augured from the bottom of the dryer. The heated air from the unit's burners passes from the burner plenum through the grain. An on-farm energy audit has identified inefficient manual control of the dryer where the operator controls the plenum temperature and the discharge auger speed to achieve the desired final moisture content. Moisture content is based on measurement of grain leaving the dryer. The plenum temperature setting depends on the moisture content of crop with a typical value of 220 F. The burner cycles on and off, automatically, as necessary to maintain the plenum temperature selected by the operator.

**After Situation:**

Energy use is reduced through installation of a more efficient continuous dryer that uses a microcomputer-based controller to reduce overdrying and total time of operation. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Rated capacity of the dryer

**Scenario Unit:** Bushel per Hour

**Scenario Typical Size:** 860.00

**Scenario Total Cost:** $192,560.72

**Scenario Cost/Unit:** $223.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Grain dryer, Axial, 12 ft. | 1158 | Grain dryer, 12 foot Axial with rated capacity of 460 bushels/hour. Materials only. | Bushel per Hour | $246.07 | 172 | $42,324.04 |
| Grain dryer, Axial, 16 ft. | 1159 | Grain dryer, 16 foot Axial with rated capacity of 600 bushels/hour. Materials only. | Bushel per Hour | $227.29 | 172 | $39,093.88 |
| Grain dryer, Centrifugal, 20 ft. | 1160 | Grain dryer, 20 foot Centrifugal with rated capacity of 785 bushels/hour. Materials only. | Bushel per Hour | $222.60 | 172 | $38,287.20 |
| Grain dryer, Centrifugal, 24 ft. | 1161 | Grain dryer, 24 foot Centrifugal with rated capacity of 860 bushels/hr. Materials only. | Bushel per Hour | $213.85 | 172 | $36,782.20 |
| Grain dryer, Axial 28 ft. | 1162 | Grain dryer, 28 foot Axial with rated capacity of 990 bushels/hr. Materials only. | Bushel per Hour | $204.97 | 172 | $35,254.84 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #18 - Tunnel Door

**Scenario Description:**

Replace the traditional tunnel inlet curtain with a solid tunnel inlet door to reduce the amount of heat leakage and reduce the amount of energy used to heat and cool the poultry house. Typical tunnel inlet door is 5 feet high and 30 feet long or 150 square feet. Typical poultry house is 40 feet by 500 feet.

**Before Situation:**

A poultry house with a traditional tunnel inlet curtain is losing heat and is inefficent while using more energy.

**After Situation:**

Replace the traditional tunnel inlet curtain with a solid tunnel inlet door to reduce the amount of heat leakage and reduce the amount of energy used to heat and cool the poultry house. Typical tunnel inlet door is 5 feet high and 30 feet long or 150 square feet. Typical poultry house is 40 feet by 500 feet. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Area of tunnel door

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 150.00

**Scenario Total Cost:** $1,462.76

**Scenario Cost/Unit:** $9.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Tunnel doors | 2413 | Tunnel doors are used to replace curtains on tunnel inlets in a poultry house. Includes materials only. | Square Feet | $8.64 | 150 | $1,296.00 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #92 - Reverse Osmosis <= 250 GPH

**Scenario Description:**

A reverse osmosis (RO) unit, installed before the evaporator, filters the sap and removes ~ 75% of the water prior to getting to the evaporator. The unit is sized in gallons per hour. The size of the RO is determined based on the existing maple sugaring operation (number of taps and the capacity of the evaporator). With a RO unit able to remove excess water,it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process. The system cost includes the RO unit, pump, vessel, membrane, wash tank, and installation. This scenario includes units that process <= 250 gallons of sap per hour.

**Before Situation:**

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced.

**After Situation:**

With an efficient RO installed in the process, ~ 75% of the water is removed from the sap, thus cutting the boil time down by ~75%. An efficiency of 1 gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** capacity of unit

**Scenario Unit:** Gallons per Hour

**Scenario Typical Size:** 135.00

**Scenario Total Cost:** $5,969.48

**Scenario Cost/Unit:** $44.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| **Materials** | | | | | | |
| Reverse Osmosis unit, fixed cost portion | 2224 | Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Each | $3,240.20 | 1 | $3,240.20 |
| Reverse Osmosis unit, variable cost portion | 2225 | Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Gallons per Hour | $19.08 | 135 | $2,575.80 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #93 - Reverse Osmosis >250 - <1000 GPH

**Scenario Description:**

A reverse osmosis (RO) unit, installed before the evaporator, filters the sap and removes ~ 75% of the water prior to getting to the evaporator. The unit is sized in gallons per hour. The size of the RO is determined based on the existing maple sugaring operation (number of taps and the capacity of the evaporator). With a RO unit able to remove excess water,it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process. The system costs includes the RO unit, pumps, vessels, membranes, wash tank, and installation. This scenario includes units that process >250 - <1000 gallons of sap per hour.

**Before Situation:**

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced.

**After Situation:**

With an efficient RO installed in the process, ~ 75% of the water is removed from the sap, thus cutting the boil time down by ~75%. An efficiency of 1 gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** capacity of unit

**Scenario Unit:** Gallons per Hour

**Scenario Typical Size:** 365.00

**Scenario Total Cost:** $10,357.88

**Scenario Cost/Unit:** $28.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| **Materials** | | | | | | |
| Reverse Osmosis unit, fixed cost portion | 2224 | Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Each | $3,240.20 | 1 | $3,240.20 |
| Reverse Osmosis unit, variable cost portion | 2225 | Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Gallons per Hour | $19.08 | 365 | $6,964.20 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #94 - Evaporator Oil-Fired

**Scenario Description:**

This practice is for the replacement of an inefficient evaporator with a new high efficiency evaporator with appurtenances. A high efficiency evaporator is designed to increase BTU output from the fuel source and provide a larger flue pan surface area to increase evaporation, thus reducing energy use. Oil-fired evaporator includes stainless steel sides and bottom, oil burner, parametric controls, and stainless steel syrup and flue pans. A 4' x 12' oil-fired evaporator with parametric controls is common for moderately-sized maple operations in New England.

**Before Situation:**

The evaporative process time for making concentrated maple syrup is extended and more fuel used because the inefficient evaporator requires more boiling to remove water from the sap

**After Situation:**

The evaporative process time for making concentrated maple syrup is reduced by 50% or more and fuel efficiency by 15% or more. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Square Foot of unit

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 48.00

**Scenario Total Cost:** $36,102.38

**Scenario Cost/Unit:** $752.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| **Materials** | | | | | | |
| Evaporator, High efficiency, oil-fired, fixed cost | 2262 | High efficient oil fired evaporator used for maple syrup processing. Fixed cost portion. Materials only. | Each | $17,757.18 | 1 | $17,757.18 |
| Evaporator, High efficiency, oil-fired, Variable cost | 2263 | High efficient oil fired evaporator used for maple syrup processing. Variable cost portion. Materials only. | Square Feet | $365.61 | 48 | $17,549.28 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #95 - Reverse Osmosis >= 1000 GPH

**Scenario Description:**

A reverse osmosis (RO) unit, installed before the evaporator, filters the sap and removes ~ 75% of the water prior to getting to the evaporator. The unit is sized in gallons per hour. The size of the RO is determined based on the existing maple sugaring operation (number of taps and the capacity of the evaporator). With a RO unit able to remove excess water,it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process. The system cost includes the RO unit, pumps, vessels, membranes, wash tank, and installation. This scenario includes units that process >= 1000 gallons of sap per hour.

**Before Situation:**

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced.

**After Situation:**

With an efficient RO installed in the process, ~ 75% of the water is removed from the sap, thus cutting the boil time down by ~75%. An efficiency of 1 gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** capacity of unit

**Scenario Unit:** Gallons per Hour

**Scenario Typical Size:** 1,200.00

**Scenario Total Cost:** $26,289.68

**Scenario Cost/Unit:** $21.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| **Materials** | | | | | | |
| Reverse Osmosis unit, fixed cost portion | 2224 | Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Each | $3,240.20 | 1 | $3,240.20 |
| Reverse Osmosis unit, variable cost portion | 2225 | Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Gallons per Hour | $19.08 | 1200 | $22,896.00 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #96 - Maple Syrup PreHeater <= 24 SF

**Scenario Description:**

The unit sets over the evaporator pan and uses steam from the evaporator pan to pre-heat the sap to as high as 200ºF while at the same time injecting air into the sap to promote evaporation. Evaporation rates are increased by 65-75%, based on vendor analysis, leading to 40-43% energy savings. Sap is concentrated from Brix 2% to 4% or more before it enters the flue pan. Steam-enhanced systems require at least 9 feet from floor to ceiling. This scenario includes units <= 24 sq. ft, with installation. With increased evaporation, it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process, as well as labor.

**Before Situation:**

The evaporative process time for making concentrated maple syrup requires boiling ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water have to be boiled off, using more fuel and labor. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced.

**After Situation:**

The evaporative process time for making concentrated maple syrup requires boiling ~6 gallons of sap to make 1 gallon of syrup, which means 14 gallons of water were removed by the steam-enhanced system, using less fuel and labor. A typical oil-fired evaporator with a steam pan consumes 2.1 to 2.7 gallons of fuel oil for each gallon of maple syrup produced to remove water from the sap, improving the fuel efficiency and saving labor. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on nonrenewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Square Foot of steam pan

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 12.00

**Scenario Total Cost:** $17,505.62

**Scenario Cost/Unit:** $1,458.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| **Materials** | | | | | | |
| Sap Pre-Heater, High efficiency, fixed cost | 2254 | High efficiency sap pre-heater device, fixed cost portion. Materials only. | Each | $12,476.78 | 1 | $12,476.78 |
| Sap Pre-Heater, High efficiency, variable cost | 2255 | High efficiency sap pre-heater device, variable cost portion. Materials only. | Square Feet | $377.38 | 12 | $4,528.56 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #97 - Evaporator Wood-Fired

**Scenario Description:**

This practice is for the replacement of an inefficient evaporator with a new high efficiency evaporator with appurtenances. A high efficiency evaporator is designed to increase BTU output from the fuel source and provide a larger flue pan surface area to increase evaporation, thus reducing energy use. Wood-fired gasifer evaporator includes stainless steel sides and bottom, blowers, and stainless steel syrup and flue pans. A 3' x 12 wood-fired gasifier evaporator is common for moderately-sized maple operations in New England.

**Before Situation:**

The evaporative process time for making concentrated maple syrup is extended and more fuel used because the inefficient evaporator requires more boiling to remove water from the sap.

**After Situation:**

The evaporative process time for making concentrated maple syrup is reduced by 50% or more and fuel efficiency by 40% or more over standard wood evaporator. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Square Foot of unit

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 36.00

**Scenario Total Cost:** $40,769.58

**Scenario Cost/Unit:** $1,132.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Evaporator, High efficiency, wood-fired, gasification system, fixed cost | 2266 | High efficient wood fired gasification system used for maple syrup processing. Fixed cost portion. Materials only. | Each | $22,832.78 | 1 | $22,832.78 |
| Evaporator, High efficiency, wood-fired, gasification system, variable cost | 2267 | High efficient wood fired gasification system used for maple syrup processing. Variable cost portion. Materials only. | Square Feet | $483.61 | 36 | $17,409.96 |

**Practice:** 374 - Energy Efficient Agricultural Operation

**Scenario** #98 - Maple Syrup PreHeater > 24 SF

**Scenario Description:**

The unit sets over the evaporator pan and uses steam from the evaporator pan to pre-heat the sap to as high as 200ºF while at the same time injecting air into the sap to promote evaporation. Evaporation rates are increased by 65-75%, based on vendor analysis, leading to 40-43% energy savings. Sap is concentrated from Brix 2% to 4% or more before it enters the flue pan. Steam-enhanced systems require at least 9 feet from floor to ceiling. This scenario includes units > 24 sq. ft. with installation. With increased evaporation, it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process, as well as labor.

**Before Situation:**

The evaporative process time for making concentrated maple syrup requires boiling ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water have to be boiled off, using more fuel and labor. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced.

**After Situation:**

The evaporative process time for making concentrated maple syrup requires boiling ~6 gallons of sap to make 1 gallon of syrup, which means 14 gallons of water were removed by the steam-enhanced system, using less fuel and labor. A typical oil-fired evaporator with a steam pan consumes 2.1 to 2.7 gallons of fuel oil for each gallon of maple syrup produced to remove water from the sap, improving the fuel efficiency and saving labor. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on nonrenewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Square Foot of steam pan

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $28,239.02

**Scenario Cost/Unit:** $705.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Sap Pre-Heater, High efficiency, fixed cost | 2254 | High efficiency sap pre-heater device, fixed cost portion. Materials only. | Each | $12,476.78 | 1 | $12,476.78 |
| Sap Pre-Heater, High efficiency, variable cost | 2255 | High efficiency sap pre-heater device, variable cost portion. Materials only. | Square Feet | $377.38 | 40 | $15,095.20 |

**Practice:** 376 - Field Operations Emissions Reduction

**Scenario** #1 - One Crop Per Year

**Scenario Description:**

Utilize equipment that allows a reduction the tillage passes through the field and/or utilizing precision GPS guidance to avoid overlap of tillage passes across the field per crop rotation. Utilize this practice only when residue and STIR values cannot be achieved when using the associated Residue and Tillage Management Practices: 329-No Till or 345-Reduced Tillage to achieve the air quality resource concern. The resource concern addressed is improved air quality by reducing combustion and particulate matter emissions primarily from tillage. The scenario costs are based on tillage equipment or GPS technology to achieve reduce tillage passes.

**Before Situation:**

Tillage operations are performed individually; each operation requiring a tractor or other power implement to pull the tillage implement resulting in multiple passes across the field. Each pass creates soil particulate emissions contributing to the area's reduced air quality.

**After Situation:**

A 376 Field Operations Emissions Reduction plan is developed showing a reduced number of field passes across the field (benchmark system compared to the planned system). As a result of applying this practice soil particulates in the air is reduced and the area's air quality is improved.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $805.20

**Scenario Cost/Unit:** $20.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 40 | $805.20 |

**Practice:** 376 - Field Operations Emissions Reduction

**Scenario** #2 - Two Crops Per Year

**Scenario Description:**

Utilize equipment that allows a reduction of tillage passes through the field and/or precision GPS guidance to avoid overlap of tillage passes across the field per crop rotation. Utilize this practice only when residue and STIR values cannot be achieved when using the associated Residue and Tillage Management Practices: 329-No Till or 345-Reduced Tillage to achieve the air quality resource concern. The resource concern addressed is improved air quality by reducing combustion and particulate matter emissions primarily from tillage. The scenario cost is based on tillage equipment or GPS technology to achieve reduced tillage passes.

**Before Situation:**

Tillage operations are performed individually; each operation requiring a tractor or other power implement to pull the tillage implement resulting in multiple passes across the field. Each pass creates soil particulate emissions contributing to the area's reduced air quality.

**After Situation:**

A 376 Field Operations Emissions Reduction plan is developed showing a reduced number of field passes across the field (benchmark system compared to the planned system). As a result of applying this practice soil particulates in the air is reduced and the area's air quality is improved.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $1,610.40

**Scenario Cost/Unit:** $40.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 80 | $1,610.40 |

**Practice:** 378 - Pond

**Scenario** #1 - Excavated, all spoil

**Scenario Description:**

A low-hazard water impoundment structure is installed by excavating an area and spreading the spoil outside the pool area. Structure is installed on agricultural lands to maintain or improve water quality and to provide water for livestock, fish and wildlife, fire control, developing renewable energy systems, and other related uses. The pond is created solely by excavating material and impounds less than 3 feet against the embankment or spoil. The excavated material is spoiled, not placed in a designed embankment. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Associated Practices: Critical area Seeding (382), Livestock Pipeline (516), Pond Sealing or Lining, Flexible Membrane (521A), Pumping Plant (533), Watering Facility (614),Structure for Water Control (587), Aquatic Organism Passage (396).

**Before Situation:**

Agricultural land has inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition and/or reduced capacity of conveyances by sediment deposition. An area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

**After Situation:**

A low-hazard water impoundment pond is constructed by excavating 4,8440 cubic yards. The spoil is spread outside the pool area using a dozer or similar excavation equipment. Water quality and/or quantity resource concerns are addressed.

**Feature Measure:** Excavated Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4,840.00

**Scenario Total Cost:** $16,724.87

**Scenario Cost/Unit:** $3.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 60 | $6,056.40 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 48 | $6,386.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 60 | $2,988.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 378 - Pond

**Scenario** #2 - Excavated, embankment less than 3 ft

**Scenario Description:**

An earthen embankment, low-hazard water impoundment structure with a principal spillway conduit and earthen auxiliary spillway (if needed) is constructed on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Associated Practices: Critical area Seeding (382), Livestock Pipeline (516), Pond Sealing or Lining, Flexible Membrane (521A), Pumping Plant (533), Watering Facility (614),Structure for Water Control (587), Aquatic Organism Passage (396).

**Before Situation:**

Agricultural land has inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition and/or reduced capacity of conveyances by sediment deposition. An area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, or irrigation. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

**After Situation:**

A low hazard pond is constructed by excavating the pool area, preparing the foundation as designed, and using 800 cubic yards to create a 500 foot embankment. The maximum embankment height is less than 3 feet at the auxiliary spillway. The emergency spill way is earthen. If auxiliary controls are needed, use appropriate practice standard. Water quality and/or quantity resource concerns are addressed.

**Feature Measure:** Embankment Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 800.00

**Scenario Total Cost:** $2,992.12

**Scenario Cost/Unit:** $3.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 8 | $807.52 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 8 | $756.08 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 378 - Pond

**Scenario** #3 - Embankment Pond without Pipe Regional

**Scenario Description:**

An earthen embankment structure with an earthen auxiliary spillway is constructed on agricultural land to maintain or improve water quality or to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems, and other related uses. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Associated Practices: Critical area Seeding (382), Livestock Pipeline (516), Pond Sealing or Lining, Flexible Membrane (521A), Pumping Plant (533), Watering Facility (614),Structure for Water Control (587), Aquatic Organism Passage (396).

**Before Situation:**

Agricultural land has inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition and/or reduced capacity of conveyances by sediment deposition. An area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

**After Situation:**

An impoundment pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed. No principle spillway pipe will be used. Water quality and/or quantity resource concerns are addressed.

**Feature Measure:** Embankment Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,100.00

**Scenario Total Cost:** $25,876.09

**Scenario Cost/Unit:** $8.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 3100 | $7,936.00 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 40 | $4,037.60 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 40 | $3,780.40 |
| Roller, vibratory, towed | 1330 | Towed vibratory smooth or tamping foot (sheepsfoot) roller compactor typically 25 ton. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer. | Hours | $91.65 | 40 | $3,666.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 80 | $3,984.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 378 - Pond

**Scenario** #4 - Embankment Pond with Pipe Regional

**Scenario Description:**

An earthen embankment with principle spillway conduit and earthen auxiliary spillway is constructed on agricultural land to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems, and other related uses. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Associated Practices: Critical area Seeding (382), Livestock Pipeline (516), Pond Sealing or Lining, Flexible Membrane (521A), Pumping Plant (533), Watering Facility (614),Structure for Water Control (587), Aquatic Organism Passage (396).

**Before Situation:**

Agricultural land has inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition and/or reduced capacity of conveyances by sediment deposition. An area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

**After Situation:**

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principal spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed.

**Feature Measure:** Embankment Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,100.00

**Scenario Total Cost:** $36,860.92

**Scenario Cost/Unit:** $11.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 3 | $1,620.90 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 1.6 | $4.10 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 3100 | $7,936.00 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 48 | $4,845.12 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 48 | $4,536.48 |
| Roller, vibratory, towed | 1330 | Towed vibratory smooth or tamping foot (sheepsfoot) roller compactor typically 25 ton. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer. | Hours | $91.65 | 48 | $4,399.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 48 | $2,455.68 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 96 | $4,781.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 19.6 | $595.06 |
| Trash Guard, metal | 1608 | Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport. | Pound | $3.50 | 118 | $413.00 |
| Pipe, CMP, 30 in., 16 Gauge | 1742 | 30 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gauge. Material cost only. | Feet | $54.20 | 8 | $433.60 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pipe, CMP, 18 in., 16 Gauge | 1743 | 18 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gauge. Material cost only. | Feet | $33.87 | 98 | $3,319.26 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 378 - Pond

**Scenario** #67 - Existing Embankment Pond Repair, with pipe

**Scenario Description:**

An existing, earthen embankment on agricultural land with new/replaced principle and earthen auxiliary spillways. The pond currently serves the purposes of maintaining and/or improving water quality and may also provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems, and other related uses. The pond was previously built or repaired with NRCS and/or Soil Conservation District assistance and is at or beyond the original, intended practice lifespan. The principal and emergency spillway features are failing due to material age and corrosion and as a result of storm events exceeding the original design storms. The barrel and riser failure can lead to piping failures within the embankment. The pond structures need repair, reconstruction and re-installation to prevent further failure, storm runoff flows and sediment deposition within downstream system. Minimal excavation is required to allow replacement of principal spillways structure(s) and installation of new auxiliary spillways to meet the current, NOAA-Atlas 14 rainfall based design storms. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Associated Practices: Critical area Seeding (382), Aquatic Organism Passage (396), Mulching (484), Livestock Pipeline (516), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Pond Sealing or Lining, Bentonite Treatment (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pumping Plant (533), Stormwater Runoff Control (570), Spoil Spreading (572), Structure for Water Control (587), Watering Facility (614).

**Before Situation:**

Agricultural land has an existing yet failing agricultural pond that was originally built to address inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition and/or reduced capacity of conveyances by sediment deposition. The pond exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. The pond was originally built/repaired with NRCS and/or Soil Conservation District technical design assistance and is at or beyond the original, intended practice lifespan and has been properly operated and maintained by the landowner. The structural and vegetated spillways and/or embankment features have failed or are at imminent risk or failure due to spillway age, degradation and/or storm events exceeding the original design storms. The pond failure would mean a total loss of water supply for the landowner and would lead to sedimentation and nutrient runoff into downstream system. Embankment and pond repairs require relatively minimal excavation and fill when compared to building an entirely new embankment.

**After Situation:**

The typical low hazard pond repair involves excavating the embankment area adjacent to the failed or failing spillway structure(s), repairing the existing or installing a new principal spillway riser and barrel pipe(s), repairing or filling/replacing the current auxiliary spillway, and backfilling 880 cubic yards of core trench/embankment material to replace the embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principal spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed.

**Feature Measure:** Excavation Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 880.00

**Scenario Total Cost:** $17,554.46

**Scenario Cost/Unit:** $19.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2 | $1,080.60 |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 0.1 | $32.42 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 340 | $870.40 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 540 | $1,382.40 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 24 | $2,422.56 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 24 | $2,268.24 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 10 | $209.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 48 | $2,390.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 26 | $789.36 |
| Trash Guard, metal | 1608 | Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport. | Pound | $3.50 | 150 | $525.00 |
| Pipe, CMP, 30 in., 16 Gauge | 1742 | 30 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gauge. Material cost only. | Feet | $54.20 | 6 | $325.20 |
| Pipe, CMP, 18 in., 16 Gauge | 1743 | 18 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gauge. Material cost only. | Feet | $33.87 | 82 | $2,777.34 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #1 - 1 row windbreak, hardwood, hand planted

**Scenario Description:**

Single 500 foot row of shrubs for wind protection, wildlife habitat, or snow management. Hardwoods planted by hand 8 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Herbaceous Weed Control (315), Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $836.61

**Scenario Cost/Unit:** $1.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2 | $25.62 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 63 | $77.49 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 63 | $355.32 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 63 | $153.72 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 30 | $3.60 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #2 - 1 row windbreak, conifers, hand planted

**Scenario Description:**

Single 500 foot row of conifer tree seedlings for wind protection, wildlife habitat, or snow management. Trees planted by hand 8 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Herbaceous Weed Control (315), Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $390.88

**Scenario Cost/Unit:** $0.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 6 | $76.86 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Large | 1515 | Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only. | Each | $1.56 | 63 | $98.28 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 20 | $2.40 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #3 - 2-row windbreak, hardwoods

**Scenario Description:**

Two 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Hardwood trees planted with a tree planting machine 8 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Herbaceous Weed Control (315), Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $596.96

**Scenario Cost/Unit:** $1.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 2 | $54.16 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 2 | $11.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 125 | $102.50 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 60 | $7.20 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #4 - 2-row windbreak, conifers

**Scenario Description:**

Two 500 foot rows of conifer tree seedlings for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 8 feet apart in the row with rows 16 feet apart. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Herbaceous Weed Control (315), Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $576.96

**Scenario Cost/Unit:** $1.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 2 | $54.16 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 2 | $11.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.66 | 125 | $82.50 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 60 | $7.20 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #5 - 3 or more row windbreak, hardwoods

**Scenario Description:**

Three or more 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management. Trees planted with a tree planting machine, 8 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Herbaceous Weed Control (315), Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $860.47

**Scenario Cost/Unit:** $1.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 3 | $81.24 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 3 | $17.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 190 | $155.80 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 95 | $11.40 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #6 - 3 or more tree rows hardwood/conifers

**Scenario Description:**

Three or more 500 foot rows of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. The outside rows are conifers the inside row(s) are hardwoods. Trees 8 feet apart with rows 16 feet apart, planted with a tree planting machine. Herbivores are not expected to browse planted seedlings, so tree shelters are not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Herbaceous Weed Control (315), Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $681.46

**Scenario Cost/Unit:** $1.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 3 | $81.24 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 3 | $17.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 63 | $51.66 |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.66 | 125 | $82.50 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 80 | $9.60 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #7 - windbreak, poultry house

**Scenario Description:**

Three or more 660 foot rows (125% of length of poultry house) of hardwood and conifer trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees are hand planted 8 feet apart in the row with rows 10 feet apart. This practice is typically applied to crop, pasture lands or headquarters. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** Number of trees

**Scenario Unit:** Each

**Scenario Typical Size:** 248.00

**Scenario Total Cost:** $4,993.03

**Scenario Cost/Unit:** $20.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 12 | $153.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 83 | $1,030.03 |
| Tree, Conifer, Potted, Medium | 1537 | Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.08 | 165 | $1,993.20 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 248 | $605.12 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 80 | $9.60 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #9 - Multi-row Tree/shrub, containerized stock

**Scenario Description:**

A multi-row linear planting of trees and shrubs to provide a buffer against wind-born sediments or chemicals. Two rows of containerized trees and shrubs are planted in an alternating pattern. One row is 4-5' trees planted on 12' centers. Second row is 30-36" shrubs planted on 5-7' centers. Trees and shrubs are protected from environmental stresses using wire mesh shelters. Irrigation installed to provide sufficient water for containerized stock. Windbreak is located in a difficult to establish area such as those prone to intense wildlife pressure or where fast establishment is necessary requiring the use of containerized plants to ensure establishment. Resource concerns: Air quality - emissions of particulate matter and objectionable odors; Soil erosion - wind. Associated Practices: Herbaceous Weed Control (315), Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

An agricultural field, livestock paddock, feedlot or farmstead is vulnerable to wind causing air quality problems. Inadequate wildlife food and cover is a factor. It is located in a difficult to establish area posing significant environmental stresses on plants.

**After Situation:**

A multi-row linear planting of trees and shrubs provides a buffer against wind-born sediments or chemicals. Wind velocity is suitably reduced to manage soil erosion, energy loss, or snow deposition. Plantings provide improved plant diversity and quality and quantity of vegetation provides food and cover for wildlife.

**Feature Measure:** Length of windbreak

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,980.00

**Scenario Total Cost:** $12,408.79

**Scenario Cost/Unit:** $6.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Trailer, flatbed, large | 1504 | Large flatbed trailer (typically 30' to 50' in length) pulled by a semi truck to transport materials and equipment. Truck not included. | Hours | $19.40 | 4 | $77.60 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.09 | 4 | $40.36 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 57.75 | $1,860.71 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Materials** | | | | | | |
| Shrub, Potted, Medium | 1527 | Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.84 | 330 | $4,237.20 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 165 | $2,047.65 |
| Tree shelter, wire mesh | 1557 | 5 feet tall, Woven Wire mesh, 6x6 inch opening or smaller, 10 gauge wire (minimum) cage placed around seedling for animal protection. Materials only. | Each | $2.23 | 495 | $1,103.85 |
| Stakes, wood, 3/4 in. x 3/4 in. x 48 in. | 1582 | 3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.01 | 990 | $1,989.90 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 60 | $7.20 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.08 | 3960 | $316.80 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #10 - Single row of tree and shrub planting with tree tubelings

**Scenario Description:**

A new row of trees is planted @ 10; spacing using stock from an approved nursery. Species selected by the planner and the producer based on the intended purpose. Tree shelters are used on all trees or shrubs for animal control. Practice will provide wind protection, wildlife habitat, or snow management. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Herbaceous Weed Control (315), Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** Feet of windbreak

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $568.26

**Scenario Cost/Unit:** $2.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 5 | $64.05 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 20 | $128.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 20 | $112.80 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 20 | $48.80 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #97 - Renovation-Supplemental hand planting with container or bare root stock

**Scenario Description:**

Parts of the windbreak being renovated have died, but it is not necessary to cut or mechanically remove the dead wood. Supplemental plantings of containerized or bare root trees/shrubs within the existing footprint of the windbreak will improve its effectiveness and longevity. The windbreak/shelterbelt is renovated through hand planting of containerized tree and/or shrub seedlings at a average spacing of 8' (shrubs 4'-6', deciduous/conifer trees 8'-12') within row and 15'-20' between rows. A windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

**Before Situation:**

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

**After Situation:**

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 726.00

**Scenario Total Cost:** $2,267.04

**Scenario Cost/Unit:** $3.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 18 | $230.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 18 | $579.96 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Shrub, Seedling, Large | 1508 | Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only. | Each | $3.32 | 36 | $119.52 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 36 | $44.28 |
| Tree, Conifer, Seedling, Large | 1515 | Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only. | Each | $1.56 | 36 | $56.16 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 36 | $168.48 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 36 | $230.40 |
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 90 | $43.20 |
| Tree shelter, solid tube type, 3-1/4 in. x 30 in. | 1560 | 3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $3.05 | 90 | $274.50 |
| Stakes, wood, 3/4 in. x 3/4 in. x 36 in. | 1581 | 3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 90 | $141.30 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Stake, bamboo, 3/8 in. x 36 in. | 1584 | 3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only. | Each | $0.17 | 90 | $15.30 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #98 - Renovation - Sod Release

**Scenario Description:**

Renovation to reduce competition from grass sod around trees/shrubs within a windbreak/shelterbelt. Apply appropriate herbicide to stress or kill competing sod vegetation between and/or within tree/shrub rows. The herbicide application is completed to significantly reduce competition from sod (grass) in the windbreak. Use WIN-PST or equivalent approved tool to evaluate herbicide impacts. Windbreak width of 60' and length of 726' are used in calculations, resulting in an area of 1 acre.

**Before Situation:**

The health of an existing windbreak/shelterbelt is deteriorating due to competition with grass sod. Trees/shrubs are dying or growth rate is reduced, and the windbreak/shelterbelt is not functioning as intended.

**After Situation:**

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and it is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 726.00

**Scenario Total Cost:** $329.45

**Scenario Cost/Unit:** $0.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Herbicide, Sethoxydim | 339 | A selective post emergence herbicide used to control annual and perennial grass weeds. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $21.98 | 1 | $21.98 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #101 - Renovation - Tree/shrub removal with chainsaw followed by hand planting

**Scenario Description:**

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. Supplemental plantings of bare root and/or containerized trees/shrubs, of conifer and/or deciduous species, or mixtures, are applied to improve the effectiveness and longevity of the windbreak. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

**Before Situation:**

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

**After Situation:**

The integrity of 726 linear feet (one acre) of windbreak/shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 726.00

**Scenario Total Cost:** $3,431.90

**Scenario Cost/Unit:** $4.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 10 | $66.50 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 18 | $230.58 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 28 | $902.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Shrub, Seedling, Large | 1508 | Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only. | Each | $3.32 | 36 | $119.52 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 36 | $44.28 |
| Tree, Conifer, Seedling, Large | 1515 | Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only. | Each | $1.56 | 36 | $56.16 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 36 | $168.48 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 36 | $230.40 |
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 90 | $43.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, solid tube type, 3-1/4 in. x 30 in. | 1560 | 3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $3.05 | 90 | $274.50 |
| Stakes, wood, 3/4 in. x 3/4 in. x 36 in. | 1581 | 3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 90 | $141.30 |
| Stake, bamboo, 3/8 in. x 36 in. | 1584 | 3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only. | Each | $0.17 | 90 | $15.30 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #102 - Renovation-Thinning or tree removal with Dozer (trees > 8 inches DBH) followed by hand planting

**Scenario Description:**

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH >8 inches. Trees and shrubs are cleared with a Dozer. All woody debris from cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Hand planting is used to replace the trees/shrubs that were removed, improving the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

**Before Situation:**

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

**After Situation:**

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 726.00

**Scenario Total Cost:** $4,246.83

**Scenario Cost/Unit:** $5.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 8 | $807.52 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 18 | $230.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Shrub, Seedling, Large | 1508 | Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only. | Each | $3.32 | 36 | $119.52 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 36 | $44.28 |
| Tree, Conifer, Seedling, Large | 1515 | Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only. | Each | $1.56 | 36 | $56.16 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 36 | $168.48 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 36 | $230.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 90 | $43.20 |
| Tree shelter, solid tube type, 3-1/4 in. x 30 in. | 1560 | 3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $3.05 | 90 | $274.50 |
| Stakes, wood, 3/4 in. x 3/4 in. x 36 in. | 1581 | 3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 90 | $141.30 |
| Stake, bamboo, 3/8 in. x 36 in. | 1584 | 3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only. | Each | $0.17 | 90 | $15.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #103 - Renovation-Thinning or tree/shrub removal with Skidsteer followed by machine planting

**Scenario Description:**

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH < 8 inches. Trees and shrubs are cleared by a Skidsteer with a tree shear or saw. All woody debris produced by cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Machine planting is used to replace the trees/shrubs that were removed, to improve the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

**Before Situation:**

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

**After Situation:**

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 726.00

**Scenario Total Cost:** $2,284.56

**Scenario Cost/Unit:** $3.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 11 | $636.35 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 3 | $17.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 11 | $354.42 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 11 | $374.22 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.76 | 48 | $36.48 |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 24 | $19.68 |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.66 | 24 | $15.84 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #104 - Renovation - Thinning or tree/shrub removal with Skidsteer followed by hand planting

**Scenario Description:**

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH < 8 inches. Trees and shrubs are cleared by a Skidsteer with a tree sheer or saw. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Hand planting is used to replace the trees/shrubs that were removed, to improve the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include: Plant pest pressure, Plant productivity and health, Inadequate livestock shelter, Wind erosion.

**Before Situation:**

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

**After Situation:**

The integrity of 726 linear feet (one acre) of windbreak/shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

**Feature Measure:** Length of Renovation

**Scenario Unit:** Feet

**Scenario Typical Size:** 726.00

**Scenario Total Cost:** $3,775.79

**Scenario Cost/Unit:** $5.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 18 | $230.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Shrub, Seedling, Large | 1508 | Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only. | Each | $3.32 | 36 | $119.52 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 36 | $44.28 |
| Tree, Conifer, Seedling, Large | 1515 | Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only. | Each | $1.56 | 36 | $56.16 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 36 | $168.48 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 36 | $230.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 90 | $43.20 |
| Tree shelter, solid tube type, 3-1/4 in. x 30 in. | 1560 | 3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $3.05 | 90 | $274.50 |
| Stakes, wood, 3/4 in. x 3/4 in. x 36 in. | 1581 | 3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 90 | $141.30 |
| Stake, bamboo, 3/8 in. x 36 in. | 1584 | 3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only. | Each | $0.17 | 90 | $15.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #109 - 1 row windbreak - small acreage

**Scenario Description:**

One row of containerized shrubs planted to address resource concerns; Inefficient Energy Use, Air Quality Impacts and/or Fish and Wildlife Habitat. This practice is typically applied on cropland at field edges and around homesteads.

**Before Situation:**

Agricultural field or farmstead needing protections from wind, additional wildlife food and cover, odor mitigation, visual screening. The area generally includes arid or drought conditions that greatly reduce the success of tree survival.

**After Situation:**

A windbreak of containerized shrubs is installed by hand planting shrubs 6 ft apart. Wind velocity suitably diminished to reduce soil erosion or energy loss. Additional wildlife food and cover, mixing of odor plumes and visual screening. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

**Feature Measure:** Length of windbreak row

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $421.29

**Scenario Cost/Unit:** $4.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2 | $25.62 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Shrub, Potted, Medium | 1527 | Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.84 | 17 | $218.28 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 17 | $2.04 |
| Fertilizer, tree, slow release, premix packet or spike | 1594 | Slow release fertilizer to gradually apply nutrients over time for tree establishment. 2.0 Oz Packet (Premixed: 16-16-16 or 16-8-8 ) or Fertilizer Spike | Each | $0.54 | 17 | $9.18 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.08 | 200 | $16.00 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #158 - 1 row windbreak, shrubs, hand planted

**Scenario Description:**

Single 500 foot row of shrubs for wind protection, wildlife habitat, or snow management. Shrubs planted by hand 4 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $343.88

**Scenario Cost/Unit:** $0.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2 | $25.62 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.76 | 125 | $95.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 20 | $2.40 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #159 - 1 row windbreak, trees, hand planted

**Scenario Description:**

Single 500 foot row of conifer tree seedlings for wind protection, wildlife habitat, or snow management. Trees planted by hand 10 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $158.64

**Scenario Cost/Unit:** $0.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 1 | $12.81 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.66 | 50 | $33.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 20 | $2.40 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #160 - 2-row windbreak, shrubs, machine planted

**Scenario Description:**

Two 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Shrubs planted with a tree planting machine 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $372.19

**Scenario Cost/Unit:** $0.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 1 | $27.08 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 1 | $5.86 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.76 | 250 | $190.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 40 | $4.80 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #161 - 2-row windbreak, trees, machine planted

**Scenario Description:**

Two 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $441.58

**Scenario Cost/Unit:** $0.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 2 | $54.16 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 2 | $11.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 100 | $82.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 40 | $4.80 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #162 - 2-row windbreak, trees, shelters, machine planted

**Scenario Description:**

Two 500 foot rows of hardwood tree seedlings for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Environmental impacts are likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $1,278.08

**Scenario Cost/Unit:** $2.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 2 | $54.16 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 2 | $11.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 100 | $82.00 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 100 | $460.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.07 | 150 | $10.50 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 150 | $366.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 40 | $4.80 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #163 - 3 or more row windbreak, shrub, machine planted

**Scenario Description:**

Three or more 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management. Shrubs planted with a tree planting machine, 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $824.37

**Scenario Cost/Unit:** $1.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 3 | $81.24 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 3 | $17.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.76 | 375 | $285.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 60 | $7.20 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #164 - 3 or more row windbreak, trees, machine planted

**Scenario Description:**

Three or more 500 foot rows of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. The outside rows are conifers the inside row(s) are hardwoods. Trees 10 feet apart with rows 16 feet apart, planted with a tree planting machine. Planted seedlings are not likely to be impacted by environmental stressors, so tree shelters are not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $398.54

**Scenario Cost/Unit:** $0.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 2 | $54.16 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 2 | $11.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 50 | $41.00 |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.66 | 100 | $66.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 40 | $4.80 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment and Renovation

**Scenario** #165 - 3 or more row windbreak, trees, shelters, machine planted

**Scenario Description:**

Three or more 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Environmental impacts are likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

**Before Situation:**

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

**Feature Measure:** length of windbreak row(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $1,551.48

**Scenario Cost/Unit:** $3.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 2 | $54.16 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 2 | $11.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 150 | $123.00 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 150 | $690.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.07 | 150 | $10.50 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 150 | $366.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 60 | $7.20 |

**Practice:** 381 - Silvopasture

**Scenario** #1 - Commercial thinning followed by establishment of native grasses.

**Scenario Description:**

Commercial thinning of an existing stand of trees followed by establishment of native grasses.

**Before Situation:**

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

**After Situation:**

The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,891.14

**Scenario Cost/Unit:** $489.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 500 | $505.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 500 | $295.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |

**Practice:** 381 - Silvopasture

**Scenario** #2 - Commercial thinning followed by establishment of introduced grasses.

**Scenario Description:**

Commercial thinning of an existing stand of trees followed by establishment of introduced grasses.

**Before Situation:**

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

**After Situation:**

The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of cool-season grasses and legumes will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $5,345.64

**Scenario Cost/Unit:** $534.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 500 | $505.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 500 | $295.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 10 | $454.50 |

**Practice:** 381 - Silvopasture

**Scenario** #3 - Non-commercial thinning followed by establishment of native grasses.

**Scenario Description:**

Non-commercial thinning of an existing stand of trees followed by establishment of native grasses.

**Before Situation:**

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

**After Situation:**

The stand is thinned non-commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $8,314.28

**Scenario Cost/Unit:** $831.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 60 | $399.00 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 500 | $505.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 500 | $295.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 10 | $1,269.10 |

**Practice:** 381 - Silvopasture

**Scenario** #4 - Non-commercial thinning followed by establishment of introduced grasses.

**Scenario Description:**

Non-commercial thinning of an existing stand of trees followed by establishment of introduced grasses.

**Before Situation:**

10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

**After Situation:**

The stand is thinned non-commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of cool-season grasses and legumes will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $7,499.68

**Scenario Cost/Unit:** $749.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 60 | $399.00 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 500 | $505.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 500 | $295.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 10 | $454.50 |

**Practice:** 381 - Silvopasture

**Scenario** #5 - Establishment of native grasses

**Scenario Description:**

Establishment of native grasses into an existing stand of trees that is already at an adequate density .

**Before Situation:**

10-acre pine plantation woodlot that has a basal area of 50 sq. ft. per acre. There is very little available forage for livestock, due to undesirable species in the understory. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition; Livestock Production Limitation - Inadequate Feed and Forage.

**After Situation:**

The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,819.54

**Scenario Cost/Unit:** $481.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 500 | $505.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 500 | $295.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 10 | $1,269.10 |

**Practice:** 381 - Silvopasture

**Scenario** #6 - Establishment of introduced grasses

**Scenario Description:**

Establishment of introduced grasses into an existing stand of trees that is already at an adequate density .

**Before Situation:**

10-acre pine plantation woodlot that has a basal area of 50 sq. ft. per acre. There is very little available forage for livestock, due to undesirable species in the understory. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition; Livestock Production Limitation - Inadequate Feed and Forage.

**After Situation:**

The soil is prepared for planting using chemical and mechanical means, then a mix of cool-season grasses and legumes will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,004.94

**Scenario Cost/Unit:** $400.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 500 | $505.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 500 | $295.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 10 | $454.50 |

**Practice:** 381 - Silvopasture

**Scenario** #7 - Establish Trees and Native Grasses

**Scenario Description:**

Establishment of trees and native grasses into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

**Before Situation:**

10-acre old field without suitable forage for livestock nor tree cover. There is very little available forage for livestock, due to undesirable species in the understory. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

**After Situation:**

The site will be prepared using chemical and mechanical means, a mix of native warm-season grasses will be established, and then 200 pine trees per acre will be planted, providing forage to livestock and wildlife, and, in time, producing a viable wood products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $6,831.30

**Scenario Cost/Unit:** $683.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 4 | $108.32 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 4 | $23.44 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 500 | $505.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 500 | $295.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 2000 | $1,640.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 2000 | $240.00 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 10 | $1,269.10 |

**Practice:** 381 - Silvopasture

**Scenario** #8 - Establish Trees and Introduced Grasses

**Scenario Description:**

Establishment of trees and introduced grasses and legumes into a field that contains neither suitable forage nor suitable tree cover for a silvopasture system.

**Before Situation:**

10-acre old field without suitable forage for livestock nor tree cover. There is very little available forage for livestock, due to undesirable species in the understory. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

**After Situation:**

The site will be prepared using chemical and mechanical means, a mix of cool-season grasses and legumes will be established, and then 200 pine trees per acre will be planted, providing forage to livestock and wildlife, and, in time, producing a viable wood products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $5,576.70

**Scenario Cost/Unit:** $557.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 10 | $60.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 4 | $108.32 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 4 | $23.44 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 500 | $505.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 500 | $295.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| Tree, Conifer, Seedling, Small | 1512 | Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.60 | 2000 | $1,200.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 2000 | $240.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 10 | $454.50 |

**Practice:** 381 - Silvopasture

**Scenario** #9 - Establish Trees

**Scenario Description:**

Establishment of trees into an existing pasture that contains adequate native or introduced forage.

**Before Situation:**

10-acre pasture with suitable forage for livestock. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Livestock Production Limitation - Inadequate Livestock Shelter.

**After Situation:**

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then 200 pine trees per acre will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. All Resource Concerns listed above are adressed.

**Feature Measure:** Acres of silvopasture established

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,644.36

**Scenario Cost/Unit:** $164.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 4 | $108.32 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 4 | $23.44 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Small | 1512 | Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.60 | 2000 | $1,200.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 2000 | $240.00 |

**Practice:** 382 - Fence

**Scenario** #1 - Barbed or Smooth Wire

**Scenario Description:**

A multi-strand, non-electric barbed or smooth wire fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. The gate is constructed using fencing materials rather than a pre-manufactured gate. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

**Before Situation:**

Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

A multi-strand, non-electric barbed or smooth wire fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Fence installation includes all posts, wire, fasteners, gates, and other necessary components. Typical installation is based on a four strand common installation. The fence is installed with consideration to wildlife.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $5,697.36

**Scenario Cost/Unit:** $2.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 14 | $134.54 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 14 | $379.12 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 36 | $1,159.92 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 14 | $476.28 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $135.85 | 6 | $815.10 |
| Post, Wood, CCA treated, 4 in x 8 ft | 10 | Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only. | Each | $14.07 | 38 | $534.66 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 44 | $1,133.88 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.21 | 2000 | $420.00 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |

**Practice:** 382 - Fence

**Scenario** #2 - Woven Wire Regional

**Scenario Description:**

A woven wire fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. A woven wire fence is typically used in applications with sheep, goats, horses, wildlife exclusion, and shelterbelt/tree protection. Entire fence is constructed using fencing material rather than pre-manufactured panels. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

**Before Situation:**

Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

A woven wire fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Woven wire fence installation includes all posts, wire, fasteners, gates, and other necessary components. A woven wire fence is typically used in applications with sheep, goats, wildlife exclusion, and shelterbelt/tree protection. The fence is installed with consideration to wildlife.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,640.00

**Scenario Total Cost:** $12,441.35

**Scenario Cost/Unit:** $4.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 35 | $336.35 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 35 | $947.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 76 | $2,448.72 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 35 | $1,190.70 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $135.85 | 2 | $271.70 |
| Wire, Woven, Galvanized, 12.5 Gauge, 48 inch | 4 | Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only. | Each | $366.93 | 8 | $2,935.44 |
| Post, Wood, CCA treated, 4 in x 8 ft | 10 | Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only. | Each | $14.07 | 168 | $2,363.76 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 44 | $1,133.88 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #3 - Electric 2 strand

**Scenario Description:**

A two strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. A two strand electric fence is typically used on dairy operations. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

**Before Situation:**

Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

A two strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Installation includes all posts, wire, fasteners, gates, fence energizer, and other incidental necessary components. The fence is installed with consideration to wildlife.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $4,443.66

**Scenario Cost/Unit:** $2.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 9.5 | $91.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 9.5 | $257.26 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 28 | $902.16 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 9.5 | $323.19 |
| **Materials** | | | | | | |
| Wire, High Tensile, 12.5 Gauge, 4,000' roll | 2 | High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only. | Each | $178.27 | 1 | $178.27 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $11.38 | 25 | $284.50 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 32 | $824.64 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $15.19 | 7 | $106.33 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $2.75 | 7 | $19.25 |
| Electric, Lightening Diverter | 22 | Electric, Lightening diverter for electric fence. Includes materials and shipping only. | Each | $11.66 | 1 | $11.66 |
| Electric, Insulated cable | 23 | Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only. | Each | $44.68 | 1 | $44.68 |
| Electric, Power Surge Protector | 24 | Electric, Power Surge Protector for electric fence. Includes materials and shipping only. | Each | $16.64 | 1 | $16.64 |
| Electric, Cutoff Switch | 25 | Electric, Cutoff Switch for electric fence. Includes materials and shipping only. | Each | $11.37 | 1 | $11.37 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $48.82 | 1 | $48.82 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $424.69 | 1 | $424.69 |
| Fence, Wire Assembly, High Tensile, Electric, 2 Strand | 33 | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only. | Feet | $0.08 | 2000 | $160.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #4 - Electric 3 strand

**Scenario Description:**

A three strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. A three strand electric fence is typically used on beef operations. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

**Before Situation:**

Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

A three strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Installation includes all posts, wire, fasteners, gates, fence energizer, and other incidental necessary components. The fence is installed with consideration to wildlife.

**Feature Measure:** Length of fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $5,753.05

**Scenario Cost/Unit:** $2.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 13.5 | $129.74 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 13.5 | $365.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 13.5 | $459.27 |
| **Materials** | | | | | | |
| Wire, High Tensile, 12.5 Gauge, 4,000' roll | 2 | High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only. | Each | $178.27 | 2 | $356.54 |
| Post, Wood, CCA treated, 4 in x 8 ft | 10 | Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only. | Each | $14.07 | 38 | $534.66 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 44 | $1,133.88 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $15.19 | 7 | $106.33 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $2.75 | 7 | $19.25 |
| Electric, Lightening Diverter | 22 | Electric, Lightening diverter for electric fence. Includes materials and shipping only. | Each | $11.66 | 1 | $11.66 |
| Electric, Insulated cable | 23 | Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only. | Each | $44.68 | 1 | $44.68 |
| Electric, Power Surge Protector | 24 | Electric, Power Surge Protector for electric fence. Includes materials and shipping only. | Each | $16.64 | 1 | $16.64 |
| Electric, Cutoff Switch | 25 | Electric, Cutoff Switch for electric fence. Includes materials and shipping only. | Each | $11.37 | 1 | $11.37 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $48.82 | 1 | $48.82 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $424.69 | 1 | $424.69 |
| Fence, Wire Assembly, High Tensile, Electric, 3 Strand | 34 | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only. | Feet | $0.16 | 2000 | $320.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #5 - Electric - 4 or more strands

**Scenario Description:**

A four or more strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. A four strand electric fence is typically used for goats, sheep, llamas, hogs or humans. Typical installation is based on a 5 strand electric fence. Associated Practices: Animal Trail or Walkway (575), Grass Waterway (412), Livestock Pipeline (516), Prescribed Grazing (528), Pond (378), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Spring Development (574), Streambank or Shoreline Protection (580), Stream Crossing (578), Use Exclusion (472), Waste Water Treatment Strip (635), Water and Sediment Control Basin (638), Watering Facility (614), and Water Well (642)

**Before Situation:**

Plant health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods on grazing lands. Water quality is impacted by increased erosion and runoff. Livestock have uncontrolled access to water bodies. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

A four or more strand, electric fence is installed to allow for implementation of a grazing management system that allows for an adequate rest and recovery period, protection of sensitive areas, improved water quality, and reduction of noxious and invasive weeds. Installation includes all posts, wire, fasteners, gates, fence energizer, and other incidental necessary components. The fence is installed with consideration to wildlife.

**Feature Measure:** Length of fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $7,289.30

**Scenario Cost/Unit:** $3.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 19 | $182.59 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 19 | $514.52 |
| Fence, Wire Assembly, High Tensile Electric, 5 Strand | 1087 | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only. | Feet | $0.20 | 2000 | $400.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 34 | $1,095.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 19 | $646.38 |
| **Materials** | | | | | | |
| Wire, High Tensile, 12.5 Gauge, 4,000' roll | 2 | High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only. | Each | $178.27 | 3 | $534.81 |
| Post, Wood, CCA treated, 4 in x 8 ft | 10 | Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only. | Each | $14.07 | 38 | $534.66 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 76 | $1,958.52 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $15.19 | 7 | $106.33 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $2.75 | 7 | $19.25 |
| Electric, Lightening Diverter | 22 | Electric, Lightening diverter for electric fence. Includes materials and shipping only. | Each | $11.66 | 1 | $11.66 |
| Electric, Insulated cable | 23 | Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only. | Each | $44.68 | 1 | $44.68 |
| Electric, Power Surge Protector | 24 | Electric, Power Surge Protector for electric fence. Includes materials and shipping only. | Each | $16.64 | 1 | $16.64 |
| Electric, Cutoff Switch | 25 | Electric, Cutoff Switch for electric fence. Includes materials and shipping only. | Each | $11.37 | 1 | $11.37 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $48.82 | 1 | $48.82 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $424.69 | 1 | $424.69 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #6 - Exclusion Fence

**Scenario Description:**

A barrier fence is installed around an NRCS constructed practice such as a waste storage system or heavy use area according to engineering design to exclude human or livestock access. The fence is permanently installed to 1) Keep humans away from waste ponds and lagoons or 2) to protect sensitive areas (Riparian areas, wetlands, springs, etc.) from heavy livestock pressure. A heavy grade fence material and close post space is required for proper installation. Associated Practices: Pond (378), Solid/Liquid Waste Separation Facility (632), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Transfer (634)

**Before Situation:**

An NRCS designed and constructed practice, such as a waste storage pond, is planned posing significant risk to human safety if not addressed. Livestock have access to sensitive areas that may cause detrimental effect to animal/human health and wildlife habitat. Resource concerns that need to be addressed are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment, and water quality due to turbidity.

**After Situation:**

Humans are livestock are excluded from the constructed practice, such as a waste storage pond, for safety purposes. A barrier fence is installed around the entire holding pond or livestock are kept away from a hydrologically sensitive area on a newly constructed heavy use area. The fence is typically five strand high tensile wire with close spacing. Improved livestock control and access to water or other sensitive areas promotes safety for livestock and humans, improves health and vigor of sensitive species, and limits soil erosion.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 450.00

**Scenario Total Cost:** $3,031.73

**Scenario Cost/Unit:** $6.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 9 | $86.49 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 9 | $243.72 |
| Fence, Wire Assembly, High Tensile Electric, 5 Strand | 1087 | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only. | Feet | $0.20 | 450 | $90.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 14 | $451.08 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 9 | $306.18 |
| **Materials** | | | | | | |
| Wire, High Tensile, 12.5 Gauge, 4,000' roll | 2 | High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only. | Each | $178.27 | 1 | $178.27 |
| Post, Wood, CCA treated, 4 in x 8 ft | 10 | Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only. | Each | $14.07 | 10 | $140.70 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 41 | $1,056.57 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 1 | $260.18 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #7 - Chain Link

**Scenario Description:**

A chain link fence is installed around an NRCS constructed practice where significant hazards exist such as a vertical wall, concrete storage tank. The safety concerns and risks associated with this type of tank are too great to risk accidental drowning and therefore, a guaranteed strong fence is need for this critical exclusion fence. The fence is permanently installed to keep humans (small children) away from waste ponds and lagoons. A heavy grade fence material and close post space is required for proper installation. The chain link fence is constructed securely in concrete and can withstand greater pressure. Chain link fence is only used in a limited number of circumstances where those significant hazards make it too great to risk endangering people and/or livestock. Associated Practices: Pond (378), Solid/Liquid Waste Separation Facility (632), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Transfer (634)

**Before Situation:**

An NRCS designed and constructed practice, such as a waste storage pond, is planned posing significant risk to human safety if not addressed. Livestock need to be excluded using a strong fence to ensure exclusion from location to prevented drowning and/or other detrimental effect to animal/human health and wildlife habitat. Resource concerns that need to be addressed are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment, and water quality due to turbidity.

**After Situation:**

Humans and livestock are excluded from the constructed practice for safety purposes and to prevent accidental drowning. A chain link fence is installed securely in concrete around the entire holding pond. The fence is typically 200 feet long with one gate and is installed by a fencing contractor. Improved livestock control and access to water or other sensitive areas promotes safety for livestock and humans, improves health and vigor of sensitive species, and limits soil erosion.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $9,303.43

**Scenario Cost/Unit:** $46.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Fence, Chain Link | 1079 | Fence, Chain Link, 5 foot High, 9 ga Wire, Posts in Concrete on 10 foot Centers. Includes all materials, equipment and labor. | Feet | $25.38 | 182 | $4,619.16 |
| Gate, Chain Link, Slide Gate, Per LF | 1081 | Chain Link Gate, 5 feet tall, per linear foot. Installed in Concrete. | Feet | $240.20 | 18 | $4,323.60 |

**Practice:** 382 - Fence

**Scenario** #8 - 8 foot netted Wildlife Exclusion Fence, Wooded

**Scenario Description:**

Excluding animals from an area in order to address identified resource concerns. This is for facilitating exclusion of animals to protect or enhance natural resource values. Control will be by woven wire or poly deer netting rated for 10 to 15 years. To the extent possible, fence will be attached to suitable trees with some posts as needed. Any need for permanent fencing will be planned and installed using the Fence practice (382). Clearing of brush and trees is not necessary. Resource concerns include Wildlife Habitat degradation, Undesirable plant productivity and health, and/or Excessive sediment in surface waters.

**Before Situation:**

Sensitive areas are threatened by the adverse actions of wild animals. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream bank stability, and/or water quality.

**After Situation:**

Sensitive areas are protected from the adverse actions of domestic and/or wild animals by excluding them from the area.

**Feature Measure:** Length of fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $11,357.75

**Scenario Cost/Unit:** $3.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Wire, Woven, Wildlife, 96 in. | 6 | High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only. | Each | $765.16 | 11 | $8,416.76 |
| Post, Wood, CCA treated, 6 in. x 12-14 ft. | 13 | Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only. | Each | $39.56 | 6 | $237.36 |
| Post, Steel T, 1.33 lbs, 10 ft. | 17 | Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only. | Each | $14.19 | 100 | $1,419.00 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.15 | 3600 | $540.00 |
| Property/Safety Signs | 293 | Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only. | Each | $2.02 | 35 | $70.70 |
| Gate, Game, 8 ft. High X 4 ft. Wide | 1082 | 4 Foot wide game gate (8 feet tall). Includes materials and shipping only. | Each | $277.11 | 1 | $277.11 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #50 - 8 foot Wildlife Exclusion Fence

**Scenario Description:**

An 8 foot, woven wire wildlife exclusion fence is installed following a harvest of an established woodlot according to a Forest management Plan where intense wildlife pressure exists. The canopy is sufficiently opened to allow understory of regeneration of desired tree species, but high wildlife density poses a browse threat to new seedlings and regrowth. An 8 foot wildlife exclusion fence is installed to restrict access to the site to allow regeneration to occur.

**Before Situation:**

A forest with a recent harvest as per a Forest Management Plan and sufficient canopy for regeneration is threatened by browse of high wildlife density causing undesirable plant species and lack of desirable understory.

**After Situation:**

An 8 foot high, woven wire wildlife exclusion fence is installed following a harvest of an established woodlot according to a Forest Management Plan. With a sufficient canopy opening, wildlife exclusion from the site allows for regeneration of desirable plant species and understory composition. Productivity, Health, and Vigor is enhanced.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 3,614.00

**Scenario Total Cost:** $22,486.65

**Scenario Cost/Unit:** $6.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 30 | $288.30 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 30 | $812.40 |
| Fence, Wire Assembly, Woven Wire, Game Fence | 1088 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.25 | 3600 | $900.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 30 | $1,020.60 |
| **Materials** | | | | | | |
| Wire, High Tensile, 12.5 Gauge, 4,000' roll | 2 | High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only. | Each | $178.27 | 2 | $356.54 |
| Wire, Woven, Wildlife, 96 in. | 6 | High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only. | Each | $765.16 | 11 | $8,416.76 |
| Post, Wood, CCA treated, 6 in. x 12-14 ft. | 13 | Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only. | Each | $39.56 | 200 | $7,912.00 |
| Property/Safety Signs | 293 | Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only. | Each | $2.02 | 35 | $70.70 |
| Gate, Game, 8 ft. High X 14 ft. Wide | 1085 | 14 feet Wide Game Gate (8 ft. tall). Includes materials and shipping only. | Each | $607.01 | 1 | $607.01 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #78 - Multi Strand Barbed or smooth Wire Difficult terrain

**Scenario Description:**

Barbed, Smooth ,or Woven Wire Difficult Installation - Installation of fence in difficult situations will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

**Before Situation:**

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. Fence installation conditions are for difficult sites such as poor access, steep slopes, rocky sites, dense brush, wet conditions etc.

**After Situation:**

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, brace posts, etc... Fence will be installed with wildlife friendly considerations.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $5,160.63

**Scenario Cost/Unit:** $3.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 10 | $96.10 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1 | $6.65 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 10 | $270.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $135.85 | 4 | $543.40 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $11.38 | 20 | $227.60 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 8 | $206.16 |
| Post, Steel T, 1.33 lbs, 6 ft. | 15 | Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only. | Each | $7.85 | 90 | $706.50 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.21 | 1320 | $277.20 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 1 | $260.18 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #113 - Multi Strand Barbed/Smooth Wire

**Scenario Description:**

Multi-strand, Barbed or Smooth Wire - Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

**Before Situation:**

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, etc... Four strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $3,930.49

**Scenario Cost/Unit:** $2.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 5 | $48.05 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 5 | $135.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 33 | $1,063.26 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $135.85 | 4 | $543.40 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $11.38 | 20 | $227.60 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 8 | $206.16 |
| Post, Steel T, 1.33 lbs, 6 ft. | 15 | Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only. | Each | $7.85 | 90 | $706.50 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.21 | 1320 | $277.20 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 1 | $260.18 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 382 - Fence

**Scenario** #114 - Electric

**Scenario Description:**

Electric - Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds.

**Before Situation:**

On grazinglands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc... Two to three strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $2,988.46

**Scenario Cost/Unit:** $2.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 3 | $28.83 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 3 | $81.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| **Materials** | | | | | | |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $11.38 | 2 | $22.76 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 8 | $206.16 |
| Post, Fiberglass, 7/8 in X 6 ft | 18 | Fiberglass line post, 7/8 inch diameter X 6 foot length. Includes materials and shipping only. | Each | $11.74 | 60 | $704.40 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $15.19 | 6 | $91.14 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $2.75 | 6 | $16.50 |
| Electric, Lightening Diverter | 22 | Electric, Lightening diverter for electric fence. Includes materials and shipping only. | Each | $11.66 | 1 | $11.66 |
| Electric, Insulated cable | 23 | Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only. | Each | $44.68 | 1 | $44.68 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $48.82 | 1 | $48.82 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $424.69 | 1 | $424.69 |
| Fence, Wire Assembly, High Tensile, Electric, 2 Strand | 33 | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only. | Feet | $0.08 | 1320 | $105.60 |
| Gate, Pipe, 10 ft. | 1056 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $236.98 | 1 | $236.98 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 383 - Fuel Break

**Scenario** #1 - Dozer

**Scenario Description:**

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment and pruning is done by hand, treating woody residue (piling/burning, crushing, or off-site removal) and mowing are mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

**Before Situation:**

Forest stand is overstocked with desirable and undesirable trees. Overstocking creates conditions conducive to wildfire movement across the landscape, and severe loss/damage of the forest stand. Shrub levels are high and significanly increase wildfire risk. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. The terrain is moderately to steeply sloped (1-30%), increasing difficulty as slope steepens.

**After Situation:**

Fuel Break is installed at the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees and pruned branches) are treated (piled/burned or lopped/scattered) so little remains in the fuel break and understory vegetation is mowed down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $7,315.87

**Scenario Cost/Unit:** $1,828.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 10 | $1,009.40 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 80 | $532.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 8 | $244.96 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 8 | $526.48 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 8 | $18.80 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 8 | $77.44 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 10 | $498.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 4 | $41.72 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 4 | $156.88 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 100 | $100.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 383 - Fuel Break

**Scenario** #2 - Dozer, Steep Slope

**Scenario Description:**

Fuel Break installation requires tree thinning, treating woody residue, pruning, and brush cutting. Thinning treatment, tree pruning and brush cutting are done by hand, treating woody residue (piling/burning, crushing, or off-site removal) is mechanized and hand treatment. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

**Before Situation:**

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. A fuel break is implemented to reduce the risk of a crown spreading wildfire. The terrain is steep, 40+%, which significantly reduces efficiency and increases cost of installation. More cutting of trees & brush and treatment of woody residue is accomplished using labor due to very steep slopes.

**After Situation:**

Fuel Break is installed at the property line or key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue, thinned trees, pruned branches and cut brush, are treated.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $12,207.09

**Scenario Cost/Unit:** $3,051.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 10 | $1,009.40 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 160 | $1,064.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 10 | $247.00 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 10 | $1,072.10 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 14 | $921.34 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 14 | $32.90 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 8 | $77.44 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 160 | $5,155.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 10 | $498.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 4 | $41.72 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 4 | $156.88 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 100 | $100.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 383 - Fuel Break

**Scenario** #3 - Masticator

**Scenario Description:**

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment and pruning is done by hand; treating woody residue (piling/burning, crushing, or off-site removal) and mowing are mostly mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

**Before Situation:**

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. Slope of terrain increases fire hazard. The terrain moderately sloped, 1-30+% increasing difficulty as slope steepens.

**After Situation:**

Fuel Break is installed at the property line or key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees, pruned branches and brush) are mostly masticated but some is piled/burned, hauled of site or lopped/scattered) understory vegetation is cut down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $7,196.81

**Scenario Cost/Unit:** $1,799.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 60 | $399.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 5 | $153.10 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 16 | $1,715.36 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 8 | $526.48 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 8 | $18.80 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 8 | $77.44 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 4 | $41.72 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 4 | $156.88 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 100 | $100.00 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 383 - Fuel Break

**Scenario** #5 - Hand Tools

**Scenario Description:**

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment, pruning, brush cutting and treating woody residue (piling/burning, crushing, or off-site removal), is done by hand. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

**Before Situation:**

Forest stand is overstocked with desirable and undesirable trees. Overstocking creates conditions conducive to wildfire movement across the landscape, and loss of the forest stand. Excess stocking is impacting the health of the desired forest ecosystem and wildfire hazard poses risk to humans, structures, air quality, plants and animals. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

**After Situation:**

A fuel break is installed by hand cutting trees, hand pruning remaining trees, piling and burning or removal of woody residue from tree cutting and pruning. FB installation is at property lines, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $10,432.54

**Scenario Cost/Unit:** $2,608.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 240 | $1,596.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 12 | $296.40 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 10 | $23.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 240 | $7,732.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 4 | $41.72 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 100 | $100.00 |

**Practice:** 383 - Fuel Break

**Scenario** #6 - Non Forest

**Scenario Description:**

A non forest fuel break occurs outside of forestlands where brush, grass and forbs dominate. Landuses where this scenario will be applied may be range, pasture or wetlands. The fuel break area is mowed/bushhog so standing vegetation is reduced to a low height. Resource concerns are degraded plant condition - wildfire hazard.

**Before Situation:**

Wildfire movement is a concern within the designated area. Vegetation is tall, dense and continuous creating conditions conducive for fire movement across the landscape.

**After Situation:**

A fuel break is installed by shredding/mowing/bushhogging a defined width at property lines, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $1,020.96

**Scenario Cost/Unit:** $255.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 8 | $244.96 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 383 - Fuel Break

**Scenario** #33 - Fuel Break-Masticator, steep slopes

**Scenario Description:**

Fuel Break installation requires tree thinning, treating woody residue, pruning, and brush cutting. Thinning is mechanized and hand cutting, tree pruning and brush cutting are done by hand, treating woody residue (piling/burning, crushing, or off-site removal) is mechanized and some hand treatment. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

**Before Situation:**

The forest stand is overstocked with trees (desirable and undesirable) and is at risk of loss if a wildfire should occur. Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. Slope of terrain significantly increases fire hazard rating due to preheating effect. The terrain is steeply sloped, 40+%, which significantly reduces implementation efficiency. More hand cutting and treatment of woody residue is accomplished using labor due to very steep slopes.

**After Situation:**

Fuel Break is installed a the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees, pruned branches and brush) are mostly masticated but some is piled/burned, hauled of site or lopped/scattered) so little remains in the fuel break and understory vegetation is cut down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $10,661.15

**Scenario Cost/Unit:** $2,665.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 120 | $798.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 12 | $296.40 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 20 | $2,144.20 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 12 | $789.72 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 14 | $32.90 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 7 | $67.76 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 12 | $408.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 20 | $996.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 4 | $41.72 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 4 | $156.88 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 384 - Woody Residue Treatment

**Scenario** #1 - Orchard/Vineyard pruning/removal

**Scenario Description:**

Slash created from orchard/vineyard prunings is chipped or mulched and removed from the site in order to accomplish one or more purposes: reducing wildfire fuels and insect/disease substrate; improving access; and/or reducing potential risk to livestock and humans. Air emission reductions are achieved by chipping or shredding the materials in lieu of burning them. Material may be incorporated in the soil, used as a dust suppressant on unpaved roads or traffic areas. Resource concerns include Wildfire hazard from excessive biomass accumulation and Emissions of particulate matter.

**Before Situation:**

Wood waste is either burned, creating an air quality issue, or left in place creating a wildfire hazard, an impediment to access, or a potential site for harboring pests. Energy conservation was not implemented.

**After Situation:**

Treatment of pruning residue results in the reduction in air pollutants, energy conservation occurred, improvement in access, and the reduction of sites that can harbor pests.

**Feature Measure:** Acres of orchard/vineyard with slas

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $6,327.94

**Scenario Cost/Unit:** $316.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 16 | $925.60 |
| Brush Chipper, 6 in. capacity | 938 | Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hours | $32.57 | 16 | $521.12 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 16 | $860.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 48 | $1,632.96 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 384 - Woody Residue Treatment

**Scenario** #2 - Treatment following catastrophic events

**Scenario Description:**

The use of a combination of hand (chainsaw) and heavy equipment similar to those used in logging to treat slash resulting from catastrophic events such as fire, wind, severe pest outbreak, ice storm, etc. This scenario will remove/treat the larger material the size of which is consistent with the large equipment used. Resource concerns include: Excessive plant pest pressure, Potential emissions of particulate matter, Wildfire hazard from excessive biomass accumulation, and Habitat degradation.

**Before Situation:**

A large amount of slash and woody residue is created as a result of a non-silvicultural event such as a wind storm, wildfire, ice storm, pest outbreak, etc. Because the slash and residue is created by a catastrophic event that can cause tree-lodging, snags, broken tops, etc.; treatment is both difficult and dangerous. The presence of this material causes adverse effects on the forest include limiting access for management purposes, increasing the wildfire hazard, increasing the risk of potential harm to humans and livestock, and providing harboring sites for pests.

**After Situation:**

The material resulting from the catastrophic event is reduced to a level that will minimize the resource concerns.

**Feature Measure:** Acres of affected forest

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $15,874.54

**Scenario Cost/Unit:** $793.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 40 | $3,780.40 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 80 | $532.00 |
| Log skidder | 942 | Equipment and power unit costs. Labor not included. | Hours | $56.20 | 40 | $2,248.00 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 40 | $2,151.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 120 | $4,082.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 384 - Woody Residue Treatment

**Scenario** #3 - Silvicultural slash treatment- light

**Scenario Description:**

Treating an area of forest slash to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving water quality. Slash is treated with both hand (cutting, lopping, etc.) and mechanically (masticating, chipping, etc.). Typically done by hand and light equipment. Resource concerns include: Wildfire hazard from excessive biomass accumulation and potential Excessive plant pest pressure.

**Before Situation:**

Woody material resulting from a silvicultural practice such as pruning or a light thinning operation is causing both fire hazard and pest issues.

**After Situation:**

Fire and pest issues are reduced with slash spread out and in contact with the ground. Additional benefits include reduced soil movement. The soil is protected and/or enhanced.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $10,651.88

**Scenario Cost/Unit:** $266.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 120 | $798.00 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 40 | $4,288.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 40 | $1,360.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 384 - Woody Residue Treatment

**Scenario** #4 - Chipping and hauling

**Scenario Description:**

Reducing woody waste created during forestry, agroforestry and horticultural activities by gathering, chipping, and hauling off site to achieve management objectives. Does not include transport from property to a commercial facility. Resource concerns include potential Emissions of particulate matter, potential Excessive plant pest pressure, and Wildfire hazard from excessive biomass accumulation .

**Before Situation:**

Woody residue causes management issues including resource access, fire hazard and sites for harboring pests.

**After Situation:**

Fire and pest issues are reduced. Air and energy resources are conserved.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $7,051.92

**Scenario Cost/Unit:** $352.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 40 | $266.00 |
| Brush Chipper, 6 in. capacity | 938 | Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hours | $32.57 | 30 | $977.10 |
| Log skidder | 942 | Equipment and power unit costs. Labor not included. | Hours | $56.20 | 10 | $562.00 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 20 | $1,075.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 60 | $2,041.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 384 - Woody Residue Treatment

**Scenario** #5 - Forest Slash Heavy

**Scenario Description:**

Treating an area of significant woody plant residues to reduce hazardous fuels and the risk of insect and disease, improve organic matter, decrease unwanted habitat, and reduce erosion while improving water quality. Slash is to be lopped/treated/crushed within a foot of the ground or moved off site to meet state fire hazard reduction standards. Typically heavy equipment are used such as masticators, mulchers, drum choppers, etc. Hand work with chainsaws are used on steep slopes. Resource concerns include potential Emission of particulate matter, Wildfire hazard from excessive biomass accumulation, Excessive plant pest pressure, and Habitat degradation.

**Before Situation:**

Heavy woody material (difficult to walk through) resulting from silvicultural/management operations caused both fire hazard, access, potential harm to humans and animals, and pest issues.

**After Situation:**

Fire, access, and pest issues are reduced with slash spread out and in contact with the ground. An additional benefit is reduced soil movement.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $14,293.20

**Scenario Cost/Unit:** $357.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 40 | $266.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 40 | $988.00 |
| Heavy mechanical site prep, drum chopping | 1316 | Mechanical operations that pushing trees and vegetation and crushing them with a water filled roller chopper. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs. | Acres | $175.21 | 40 | $7,008.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 80 | $2,721.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 386 - Field Border

**Scenario** #5 - Field Border, Native Species

**Scenario Description:**

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of organic seed for herbaceous species.

**Before Situation:**

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

**After Situation:**

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices while creating a buffer between organic systems and conventional cropping systems. Native grasses and legumes will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to the site, not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

**Feature Measure:** number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $188.81

**Scenario Cost/Unit:** $188.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 3 | $39.63 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |

**Practice:** 386 - Field Border

**Scenario** #6 - Field Border, Introduced Species

**Scenario Description:**

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced species.

**Before Situation:**

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

**After Situation:**

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, will not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $131.73

**Scenario Cost/Unit:** $131.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 20 | $20.20 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 1 | $45.45 |

**Practice:** 386 - Field Border

**Scenario** #7 - Field Border, Pollinator

**Scenario Description:**

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly species.

**Before Situation:**

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

**After Situation:**

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, will not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $504.77

**Scenario Cost/Unit:** $504.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 3 | $39.63 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |

**Practice:** 386 - Field Border

**Scenario** #47 - Field Border, Pollinator, Forgone Income

**Scenario Description:**

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production.

**Before Situation:**

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

**After Situation:**

The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $835.93

**Scenario Cost/Unit:** $835.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 3 | $39.63 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.5 | $178.04 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.5 | $153.13 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |

**Practice:** 386 - Field Border

**Scenario** #66 - Field Border, Shrubs with Shelters

**Scenario Description:**

A strip of shrubs is established along the edge of the field, creating a soft edge and providing food and cover for wildlife and/or pollinators. Shelters are needed to protect new seedlings from environmental stressors. Resource concern: fish and wildlife - degraded habitat. This includes providing food sources for pollinators.

**Before Situation:**

The edge of an agricultural field lacks a soft edge of shrubs, limiting food and cover for early successional edge species.

**After Situation:**

The edge of the agricultural field is established to at least 2 rows of shrubs that provide food and cover for early successional wildlife and/or pollinators.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,933.24

**Scenario Cost/Unit:** $4,933.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 16 | $204.96 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 680 | $890.80 |
| Tree shelter, solid tube type, 3-1/4 in. x 30 in. | 1560 | 3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $3.05 | 510 | $1,555.50 |
| Stakes, wood, 1 in. x 1 in. x 36 in. | 1577 | 1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.01 | 510 | $515.10 |

**Practice:** 386 - Field Border

**Scenario** #80 - Small Scale Field Border

**Scenario Description:**

A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced plant species.

**Before Situation:**

Before practice conditions may vary based on farm size and location. Fields may have erosion by wind or water. Site provides little wildlife food or cover or pollinator habitat. Site soil organic matter is depleting. Particulate matter as dust is generated by field activity.

**After Situation:**

The 386 Implementation Requirements have been developed and applied for the site. Field border widths are based on NRCS local design criteria specific to the purpose for installing the practices. Species selected shall be adapted to site and not host disease or pests of the adjacent field crop. Species have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

**Feature Measure:** planted area

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $187.72

**Scenario Cost/Unit:** $93.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.05 | $0.66 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.05 | $1.11 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 10 | $10.20 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 10 | $10.10 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 0.1 | $4.55 |

**Practice:** 388 - Irrigation Field Ditch

**Scenario** #9 - Irrigation Field Ditch

**Scenario Description:**

This scenario is the construction of an Irrigation Field Ditch. Typical construction dimensions are 2' wide bottom x 2' deep x 1320' length with a side slope of 2:1. Resource concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water Associated Conservation Practices: 320-Irrigation Canal or Lateral; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline.

**Before Situation:**

Water supply for an area is inadequate for crop production and irrigation water application is inefficient.

**After Situation:**

An earthen canal that has adequate capacity to convey sufficient irrigation water to meet the demands of the system and make irrigation practical for the crops being grown.

**Feature Measure:** Volume of earth excavated

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 587.00

**Scenario Total Cost:** $1,841.00

**Scenario Cost/Unit:** $3.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 587 | $1,502.72 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 390 - Riparian Herbaceous Cover

**Scenario** #1 - Native Seeding, Cropland

**Scenario Description:**

Native Grasses with Forbs: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats on cropland where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection ( 580), Vegetated Treatment Area (635), Wetland Enhancement ( 659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily native grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required
Associated Practices: Herbaceous Weed Control (315), Wetland Wildlife Habitat Habitat Managment (644), Upland Wildlife Habitat Management (645).

**Before Situation:**

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource conern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

**After Situation:**

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

**Feature Measure:** Acres of Riparian Herbaceous Cove

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,328.96

**Scenario Cost/Unit:** $1,328.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 2 | $126.66 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.5 | $178.04 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.25 | $76.56 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.25 | $63.03 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 390 - Riparian Herbaceous Cover

**Scenario** #2 - Native Seeding, Pasture

**Scenario Description:**

Native Grasses with Forbs: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in pasture or forestland where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection ( 580), Vegetated Treatment Area (635), Wetland Enhancement ( 659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily native grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required
Associated Practices: Brush Management (314), Herbaceous Weed Control (315), Fence (382), Animal Trails and Walkways (575), Stream Crossing (578) Wetland Wildlife Habitat Habitat Managment (644), Upland Wildlife Habitat Management (645).

**Before Situation:**

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource conern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

**After Situation:**

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

**Feature Measure:** Acres of Riparian Herbaceous Cove

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,181.50

**Scenario Cost/Unit:** $1,181.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 2 | $126.66 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 8.5 | $170.17 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 390 - Riparian Herbaceous Cover

**Scenario** #54 - Cool Season Grasses with Forbs

**Scenario Description:**

Cool Season Grasses with Forbs: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time. The typical setting for this scenario is a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide adequate habitat. Where the establishment of a riparian herbaceous plant community is desired, site adapted species of grasses, legumes, and/or forbs will be planted by no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasive species, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seed mixes should include adapted species of warm season grasses and forbs. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nationwide.

**Before Situation:**

Riparian zone vegetation is currently an undesirable or inadequate stand of perennial or annual vegetation as determined by the NRCS Stream Visual Assessment Protocol. Natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time. Existing vegetation does not provide adequate food, cover, and/or connectivity for riparian wildlife, and contributes insufficient amounts of organic matter for stream species food and cover. Riparian vegetation quality and/or quantity have been compromised by human activities and/or access of vehicles, people, and/or livestock to the extent that the riparian area is not functioning to provide the necessary stream and riparian habitat components. Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical methods to ensure establishment success of the new planting.

**After Situation:**

The riparian zone is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

**Feature Measure:** Acres of Riparian Herbaceous Cove

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.50

**Scenario Total Cost:** $376.56

**Scenario Cost/Unit:** $753.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.5 | $11.14 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 1 | $27.08 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 0.5 | $135.19 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 390 - Riparian Herbaceous Cover

**Scenario** #55 - Pollinator Habitat

**Scenario Description:**

Pollinator Habitat: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time. The typical setting for this scenario is a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of grasses, sedges, rushes, ferns, legumes, and/or forbs tolerant to the site conditions will be planted. Site adapted species of grasses, legumes, and/or forbs will be planted by no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasive species, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Include 5-10 adapted forb species that bloom sequentially throughout the growing season. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nationwide.

**Before Situation:**

Riparian zone vegetation is currently an undesirable or inadequate stand of perennial or annual vegetation as determined by the NRCS Stream Visual Assessment Protocol. Natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time. Existing vegetation does not provide adequate food, cover, and/or connectivity for riparian wildlife, and contributes insufficient amounts of organic matter for stream species food and cover. Riparian vegetation quality and/or quantity have been compromised by human activities and/or access of vehicles, people, and/or livestock to the extent that the riparian area is not functioning to provide the necessary stream and riparian habitat components. Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical methods to ensure establishment success of the new planting.

**After Situation:**

The riparian zone is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

**Feature Measure:** Acres of Riparian Herbaceous Cove

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.50

**Scenario Total Cost:** $496.83

**Scenario Cost/Unit:** $993.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.5 | $11.14 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 1 | $27.08 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 0.5 | $221.44 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 390 - Riparian Herbaceous Cover

**Scenario** #56 - Plugging and Seeding

**Scenario Description:**

Plugging: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection ( 580), Vegetated Treatment Area (635), Wetland Enhancement ( 659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of grasses, sedges, rushes, ferns, legumes, and/or forbs tolerant to the site conditions will be planted. Grasses such as prairie cordgrass (Spartina pectinata), sedges, rushes, and/or ferns will be planted using plugs. Additional site adapted species of grasses, legumes, and/or forbs may be added by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required

**Before Situation:**

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource conern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

**After Situation:**

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

**Feature Measure:** Acres of Riparian Herbaceous Cove

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.50

**Scenario Total Cost:** $1,857.26

**Scenario Cost/Unit:** $3,714.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 2 | $126.66 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 391 - Riparian Forest Buffer

**Scenario** #1 - Bareroot, hand planted with tube

**Scenario Description:**

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. Trees and shrubs to be planted on 10' x 10' spacing and protected from deer browse with 5' tall shelters. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Associated Practices: Access Control (472), Fence (382), Filter Strip (3932), Herbaceous Weed Control (315), Mulching (484), Livestock Pipeline (516), Pond (378), Spring Development (574), Streambank Protection (580), Stream Crossing (578), Tree & Shrub Establishment (612), Tree & Shrub Site Preparation (490), Watering Facility (614), Water Well (642)

**Before Situation:**

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

**After Situation:**

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $14,809.89

**Scenario Cost/Unit:** $4,936.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 8 | $102.48 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1.5 | $534.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.75 | $229.69 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.75 | $189.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 27 | $869.94 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 1305 | $1,605.15 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 1305 | $7,360.20 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 1305 | $3,184.20 |

**Practice:** 391 - Riparian Forest Buffer

**Scenario** #2 - Bareroot, machine planted, with tree tubes

**Scenario Description:**

Establish a buffer of hardwood trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. Trees seedlings will be planted on 10' x 10' spacing and protected from deer browse with 5' tall shelters. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Associated Practices: Access Control (472), Fence (382), Filter Strip (3932), Herbaceous Weed Control (315), Mulching (484), Livestock Pipeline (516), Pond (378), Spring Development (574), Streambank Protection (580), Stream Crossing (578), Tree & Shrub Establishment (612), Tree & Shrub Site Preparation (490), Watering Facility (614), Water Well (642)

**Before Situation:**

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

**After Situation:**

A buffer of hardwood trees will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $14,897.15

**Scenario Cost/Unit:** $4,965.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8.8 | $217.36 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 8.8 | $238.30 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.09 | 5.6 | $56.50 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 5.6 | $32.82 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1.5 | $534.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.75 | $229.69 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.75 | $189.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5.6 | $190.51 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 7 | $374.57 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 1305 | $1,605.15 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 1305 | $7,360.20 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 1305 | $3,184.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 391 - Riparian Forest Buffer

**Scenario** #3 - Small container, hand planted

**Scenario Description:**

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted small containerized (1 quart) shrubs and/or deciduous trees. Planting for shrubs will be done at 6' x 6' spacing, and deciduous tree spacing at 15 x 15'. Tree shelters will be placed on the hardwoods. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Associated Practices: Access Control (472), Fence (382), Filter Strip (3932), Herbaceous Weed Control (315), Mulching (484), Livestock Pipeline (516), Pond (378), Spring Development (574), Streambank Protection (580), Stream Crossing (578), Tree & Shrub Establishment (612), Tree & Shrub Site Preparation (490), Watering Facility (614), Water Well (642)

**Before Situation:**

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

**After Situation:**

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $16,343.42

**Scenario Cost/Unit:** $5,447.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 12 | $296.40 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 12 | $164.04 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 12 | $153.72 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1.5 | $534.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.75 | $229.69 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.75 | $189.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 74 | $2,384.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 909 | $6,199.38 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 435 | $2,035.80 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 435 | $2,453.40 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 435 | $1,061.40 |

**Practice:** 391 - Riparian Forest Buffer

**Scenario** #4 - Large container, hand planted

**Scenario Description:**

A buffer of trees and shrubs is established into a suitable prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planting containerized stock of 1 gallon shrubs and 3 gallon trees. One zone is 15' wide comprised of randomly planted trees spaced approximately 10' to 15' on center and zone 2, 40' wide is comprised of a mixture of trees and shrubs planted at a 5'-7' spacing. Used in limited situations where survivability is an issue. The area is planted with a minimum density of 200 plants per acre. In mature riparian forests, canopy tree stem density is roughly 150 stems per acre of trees and shrubs. A 75% survivability rate is assumed. Larger container stock is necessary due to high deer pressure (browse and rub), competition, and other envionmental factors requiring a quick establishment time to ensure survivability to reach desired canopy at maturity. Due to the expense, this option is only appropriate in select situations when needed for rapid establishment and critical pressure. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Associated Practices: Access Control (472), Fence (382), Filter Strip (3932), Herbaceous Weed Control (315), Mulching (484), Livestock Pipeline (516), Pond (378), Spring Development (574), Streambank Protection (580), Stream Crossing (578), Tree & Shrub Establishment (612), Tree & Shrub Site Preparation (490), Watering Facility (614), Water Well (642)

**Before Situation:**

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

**After Situation:**

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,655.01

**Scenario Cost/Unit:** $7,655.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 12 | $164.04 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.09 | 12 | $121.08 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 65 | $832.65 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 4 | $50.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1.5 | $534.11 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.75 | $229.69 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.75 | $189.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 64 | $2,062.08 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 150 | $1,023.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 50 | $620.50 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 391 - Riparian Forest Buffer

**Scenario** #26 - Cuttings

**Scenario Description:**

Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of tree and/or shrub poles and live stakes (whips) planted by hand. Materials will be from a nearby, off-site location. The ratio of whips to poles will be 5:1. The cuttings will be planted in a mosaic pattern while still dormant. Tree mesh will be placed on the large cuttings. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.

**Before Situation:**

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

**After Situation:**

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,710.59

**Scenario Cost/Unit:** $5,710.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 10 | $96.10 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 10 | $247.00 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 10 | $185.50 |
| Tractor, agricultural, 30 HP | 1501 | Agricultural tractor with horsepower range of less than 50. Equipment and power unit costs. Labor not included. | Hours | $8.95 | 10 | $89.50 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.09 | 10 | $100.90 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 10 | $128.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 70 | $2,255.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Tree & Shrub, Woody, Cuttings, Medium | 1308 | Woody cuttings, live stakes or whips typically 1/4 to 1 inch diameter and 24 to 48 inches long. Includes materials and shipping only. | Each | $1.67 | 250 | $417.50 |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $12.18 | 50 | $609.00 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.26 | 50 | $63.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 391 - Riparian Forest Buffer

**Scenario** #42 - Seeding

**Scenario Description:**

Establish a buffer of trees and/or shrubs to restore riparian plant communities and provide associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and will be at least 35 feet wide. The planting will consist of trees and/or shrubs planted through direct broadcast seeding, incorporated with light tillage. The planting rate will be approximately 30 pounds of seeds per acre. Resource concerns to be addressed are: Nutrients Transported to Surface Water; Sediment Transported to Surface Water; Bank Erosion from Streams, Shorelines or Water Conveyance Channels; Elevated Water Temperature; Plant Structure and Composition; Plant Productivity and Health; Terrestrial Habitat for Wildlife and Invertebrates; Aquatic Habitat for Fish and other Organisms.

**Before Situation:**

Typical sites include former riparian forests, and habitat used for forage, cropland, associated ag land, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area and/or in the water. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

**After Situation:**

A buffer of trees and shrubs has been established along the riparian corridor to provide stability, filtration, shade, and desirable habitat to address the resource concerns.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $2,777.15

**Scenario Cost/Unit:** $277.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 10 | $122.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Trees and shrubs, seed | 1871 | Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only. | Pound | $7.14 | 300 | $2,142.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 393 - Filter Strip

**Scenario** #5 - Filter Strip, Native species

**Scenario Description:**

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of native species.

**Before Situation:**

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural properties. Water Quality resource concerns are associated with this practice.

**After Situation:**

The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

**Feature Measure:** number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $271.03

**Scenario Cost/Unit:** $271.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 3 | $39.63 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 1.5 | $27.83 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Medium Density | 2751 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $181.30 | 1 | $181.30 |

**Practice:** 393 - Filter Strip

**Scenario** #6 - Filter Strip, Introduced species

**Scenario Description:**

A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species.

**Before Situation:**

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural properties. Water Quality resource concerns are associated with this practice.

**After Situation:**

The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

**Feature Measure:** Number of acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $232.20

**Scenario Cost/Unit:** $232.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 3 | $39.63 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 1.5 | $27.83 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 20 | $20.20 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |

**Practice:** 394 - Firebreak

**Scenario** #1 - Constructed - Light Equipment

**Scenario Description:**

Installation of a bare-ground firebreak of a minimum width of 15' around a 20 acre field/farm using farm equipment (2 passes). Generally water control devices such as water bars are not needed due either to the lack of steep terrain or the temporary nature of the firebreak. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

**Before Situation:**

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Installation will be accomplished by making two passes with the use of typical farm equipment such as tractors, plows, disks, or similar implements.

**After Situation:**

The property is adequately protected from wildfire or can be safely prescribe burned.

**Feature Measure:** Length of firebreak

**Scenario Unit:** 100 Foot

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $180.52

**Scenario Cost/Unit:** $4.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 2 | $40.26 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |

**Practice:** 394 - Firebreak

**Scenario** #2 - Constructed - Medium equipment, flat-medium slopes

**Scenario Description:**

Use of medium equipment such as small dozers to blade, disk, plow, etc. 10' wide bare-soil firebreaks on slopes less than 15%. Generally, water control devices such as water bars are limited to 10 or less per 1,000 feet when properly planned and installed using the same equipment. Resource concerns include Wildfire hazards from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

**Before Situation:**

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical.

**After Situation:**

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is negligible.

**Feature Measure:** Length of firebreak

**Scenario Unit:** Feet

**Scenario Typical Size:** 3,000.00

**Scenario Total Cost:** $1,852.92

**Scenario Cost/Unit:** $0.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $3.41 | 325 | $1,108.25 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 394 - Firebreak

**Scenario** #3 - Constructed - Medium equipment, steep slopes

**Scenario Description:**

Use of equipment such as small dozers to blade 10' wide bare-soil firebreaks on slopes greater than 15%. Water control devices such as water bars placed at approximately 15 to 25 per 1,000 ft section of firebreak, are necessary to control erosion. These will be installed with the same equipment. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, Habitat degradation, Soil erosion, and Excessive sediment in surface waters.

**Before Situation:**

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes increase, the potential for excessive erosion increases from soil disturbances. Therefore the installation of water control devices such as water bars will be important in protecting the resource base.

**After Situation:**

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

**Feature Measure:** Length of firebreak

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $1,767.67

**Scenario Cost/Unit:** $1.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $3.41 | 300 | $1,023.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 394 - Firebreak

**Scenario** #4 - Vegetated permanent firebreak

**Scenario Description:**

Establishing a 20 foot wide strip of permanent vegetation that will serve as a green firebreak. Scenario includes clearing the site, preparing the seedbed, seeding (typically cool season grasses and/or legumes), and applying needed soil amendments. Clearing will be achieved with the use of a bush hog or similar equipment. Seedbed preparation and vegetation establishment will be accomplished with farm equipment. Soil amendments will be applied according to local FOTG guidance. This scenario does not include follow-up maintenance operations such as weed control. mowing, etc. Resource concerns include Wildfire hazard from excessive biomass accumulation, Soil erosion, and Excessive sediment in surface waters.

**Before Situation:**

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn.

**After Situation:**

The property is adequately protected from wildfire or can be safely prescribe burned. Wildlife habitat will also be enhanced and the potential for erosion from the firebreak is minimized.

**Feature Measure:** Length of firebreak

**Scenario Unit:** Feet

**Scenario Typical Size:** 3,000.00

**Scenario Total Cost:** $918.87

**Scenario Cost/Unit:** $0.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 4 | $122.48 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 4 | $80.52 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 1 | $11.87 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 70 | $70.70 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 70 | $41.30 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 1 | $109.15 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 394 - Firebreak

**Scenario** #5 - Constructed - Wide, bladed or disked firebreak

**Scenario Description:**

Installing a bare-ground firebreak with a width of 30' or more on gently to strongly sloping slopes with equipment such as a dozer with a heavy disk. Using smaller equipment, erosion control devices such as water bars will be installed at approximately 15 to 25 per 1,000 feet of firebreak length. Devices will have stable outlets. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, Habitat degradation, Soil erosion, and Excessive sediment in surface waters.

**Before Situation:**

Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Wide firebreaks are needed due to topography, high wildfire risk or to their use as down-wind breaks for prescribed burns. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes increase, the potential for excessive erosion increases from soil disturbances. Therefore the installation of water control devices such as water bars will be important in protecting the resource base.

**After Situation:**

The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

**Feature Measure:** Length of firebreak

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $4,539.93

**Scenario Cost/Unit:** $4.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Fire Plow | 1306 | Heavy wildland plow or disk used for installing firebreaks. Equipment costs only for plow, use with a dozer component. Labor not included. | Hours | $36.54 | 4 | $146.16 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $3.41 | 800 | $2,728.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #1 - Stream Habitat Enhancement

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where restoration is necessary to increase habitat and functionality of the stream. A combination of structures, excavation, channel shaping, and woody materials are considered based on natural channel design concepts. A local stream assessment with technical specialists (such as the Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools) are not currently present in the stream or are limited for aquatic species. A project design for restoration of the stream channel (channel shaping, boulder placement, wood, wood structures, etc) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Stream restoration components including wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. This scenario involves restoring a 300 foot stretch of the stream. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species.

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol or onsite technical specialist assessment. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat. Bank and floodplain instability are present due to altered stream hydraulics due to degradation of the stream channel.

**After Situation:**

Stream habitat within the project reach is improving as a result of completing a stream restoration based on natural channel designin the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** The entire reach of the impacted st

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $10,377.92

**Scenario Cost/Unit:** $34.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $12.18 | 300 | $3,654.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 25 | $2,238.00 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.68 | 10 | $106.80 |
| Native Perennial Grasses, Legumes and/or Forbs, Low Density | 2753 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping. | Acres | $176.63 | 0.1 | $17.66 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #2 - Riparian Zone Improvement-Forested

**Scenario Description:**

This scenario describes fish and wildlife habitat improvement and/or management actions focused on the community structure and function of forested riparian zone plant communities. The planned activity meets the 395 standard, and facilitating practice standards, especially Codes 390 and 391, utilized in combination to satisfy all requirements specific to habitats needed for the stream and riparian species for which the practice is being implemented. Implementation will improve instream and riparian habitat complexity, water quality, hiding and resting cover, and/or increased food availability for desired riparian and stream species. Because species and habitats differ dramatically within and across regions and/or MLRAs, up to 12 riparian plant community-specific scenarios may be required across the US. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 for those elements. The site does not have adequate food, cover, and/or connectivity for riparian wildlife, and contributes insufficient amounts of organic matter andor large woody material for stream species food and cover. The site's riparian vegetation is compromised by human activities and/or access of vehicles, people, and/or livestock is not controlled adequately to protect riparian functions and stream habitat quality. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be reduced due to compaction. Riparian vegetation quality and/or quantity is compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components.

**After Situation:**

Revegetation/reforestation of the riparian zone is completed and the vegetation community is under close management to insure long-term survival and ecological succession of the plant community. The quality and quantity of the riparian zone components of the site are managed to support a diverse vegetation community suitable for the site, the species that depend on it for habitat, and the functions it performs or will eventually perform as the vegetation matures. These functions include: stream temperature moderation thru shading, recruitment of instream large wood and/or non-woody organic matter, riparian habitat for terrestrial insects and other riparian-dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

**Feature Measure:** acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $23,567.80

**Scenario Cost/Unit:** $11,783.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 16 | $851.36 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 160 | $8,185.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 40 | $5,291.20 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 1 | $42.88 |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $12.18 | 200 | $2,436.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 200 | $246.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, wire mesh | 1557 | 5 feet tall, Woven Wire mesh, 6x6 inch opening or smaller, 10 gauge wire (minimum) cage placed around seedling for animal protection. Materials only. | Each | $2.23 | 200 | $446.00 |
| Native Perennial Grasses, Legumes and/or Forbs, Low Density | 2753 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping. | Acres | $176.63 | 2 | $353.26 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #3 - Instream wood placement

**Scenario Description:**

This scenario involves placement of large wood (logs, root wads, log structures) into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components lacking for aquatic species (i.e. large wood, pools). A project design for wood placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large wood and root wads placed into the stream will mimic genus, age, and size of mature trees found in intact, reference riparian areas in the MLRA where the project is located. Large wood/trees with rootwads intact should be placed in streams to create pool habitat according to NRCS engineering specifications and with close review & approval of a fish habitat biologist. Boulders placed to provide ballast shall only be used if the geomorphic setting and project design demand this component. The planned activity will meet the current 395 standard, and facilitating practice standards utilized, including timing of work windows required for protected aquatic and riparian species, and protecting/restoring vegetation and substrates of/to areas impacted by heavy equipment. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Monitoring records demonstrating implementation of this scenario will address resource concerns for stream species of concern are required. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing logs, root wads, and/or wood structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Bankfull width x reach length

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $21,968.96

**Scenario Cost/Unit:** $21,968.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 16 | $2,128.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 8 | $842.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 20 | $607.20 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 30 | $934.50 |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 1 | $42.88 |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $12.18 | 300 | $3,654.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 40 | $3,580.80 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 50 | $39.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 15 | $441.75 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $211.65 | 30 | $6,349.50 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.68 | 20 | $213.60 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #4 - Instream rock placement

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project that places individual boulders or boulder clusters, or rock structures in or adjacent to the stream channel as habitat components. A project design for boulder placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Boulders should be placed in streams to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologis onsite during implementation of the project design. Spawning gravel placement should be placed to restore spawning area substrates potentially disturbed by rock placement. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, spawning habitat, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of stream habitat assessment, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may be also compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood, leaf matter, and shade. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**After Situation:**

Stream habitat within the project reach is improving as a result of placing boulders or constructing rock structures in the channel and/or along the stream bank. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

**Feature Measure:** Bankfull width x reach length

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $16,989.13

**Scenario Cost/Unit:** $16,989.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 16 | $2,128.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 8 | $842.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 30 | $910.80 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 120 | $3,738.00 |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $12.18 | 100 | $1,218.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 60 | $5,371.20 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 20 | $589.00 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #5 - Rock and wood structures

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of large wood and rock structures into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools ) are not currently present in the stream or are limited for aquatic species. A project design for placement of habitat structures (boulders, boulder clusters, wood, wood structures) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. This scenario involves restoring one acre of stream. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing logs, rocks, or constructing wood and rock structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Feature Measure:** stream length X bankfull width

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $38,685.74

**Scenario Cost/Unit:** $38,685.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 16 | $2,128.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 8 | $842.24 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 180 | $9,631.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 32 | $4,232.96 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 17 | $516.12 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 60 | $1,869.00 |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 1 | $42.88 |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $12.18 | 300 | $3,654.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 40 | $3,580.80 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 8 | $6.24 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 7 | $206.15 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $211.65 | 30 | $6,349.50 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.68 | 10 | $106.80 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #6 - Fish Barrier

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on the stream channel. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in protecting native aquatic fauna in the reach from competition or harrassament from non-native fish. This action may also increase food availability for fish and other stream species located above the constructed barrier. Payment for implementation is to defray the costs of stream habitat assessment above the barrier, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for aquatic and riparian species of concern will be required.Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

In this stream corridor, native aquatic species are at risk as determined by the state fish and wildlife agency. NRCS Stream Visual Assessment Protocol for the reach being protected by a barrier meets quality criteria and provides habitat for native species of concern, as determined by a Stream Visual Assessment Protocol score of greater than 5 .

**After Situation:**

Native fish inhabiting areas upstream of the newly constructed concrete barrier will not be adversely affected by interactions with non-native species/competitors.

**Feature Measure:** Each

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $42,479.65

**Scenario Cost/Unit:** $8,495.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 60 | $32,418.00 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 10 | $1,330.50 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 36 | $5,372.64 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 10 | $498.10 |
| **Materials** | | | | | | |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 40 | $31.20 |
| Plywood, 3/4 inch, untreated | 1833 | Untreated 4 x 8 ft. sheets of 3/4 inch exterior grade plywood. Includes materials only. | Each | $69.01 | 15 | $1,035.15 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #7 - Cribbing Mudsill 10 section

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures to build a mudsill. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools ) are not currently present in the stream or are limited for aquatic species. A project design for placement of habitat structures (boulders, boulder clusters, wood, wood structures) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. The bank is sloped back, logs set on rocks parallel to stream, boards set on top perpendicular to make shelter below pool level. Rock placed on top and then filled and sloped, protected with fabric .Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. This scenario involves restoring one acre of stream. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing a 10' section of mudsill along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Each 10' Section

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,544.92

**Scenario Cost/Unit:** $1,544.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 1 | $125.11 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1 | $6.65 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 1 | $53.78 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Dimension Lumber, untreated | 1045 | Untreated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners. | Board Feet | $2.08 | 100 | $208.00 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 4 | $211.64 |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.70 | 14 | $23.80 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 2 | $179.04 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $211.65 | 2 | $423.30 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 0.2 | $96.03 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #8 - Midstream Structure - 10 Boulders or 3 mid str log structures

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of large wood and rock structures into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools ) are not currently present in the stream or are limited for aquatic species. A project design for placement of habitat structures (boulders, boulder clusters, wood, wood structures) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing bouldersin groups of 10 or constructing 3 log mid stream structures or some combination in the channel. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

**Feature Measure:** Each group

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,078.78

**Scenario Cost/Unit:** $1,078.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 1 | $125.11 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 0.5 | $26.89 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 1.5 | $74.72 |
| **Materials** | | | | | | |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 2.5 | $223.80 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 40 | $31.20 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $211.65 | 2 | $423.30 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 0.2 | $96.03 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #9 - Deflector, Rock <= 80 ton

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of large rock deflector (<= 80tons) with or without log structures into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools ) are not currently present in the stream or are limited for aquatic species. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Rock deflctors, generally more than one, will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing a 60 ton rock deflector with several logs into the channel from the stream bank. Stream habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Each structure

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,273.66

**Scenario Cost/Unit:** $5,273.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 2 | $250.22 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 1 | $57.85 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1 | $6.65 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 0.5 | $26.89 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2.5 | $124.53 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 30 | $1,587.30 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 15 | $1,342.80 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 5 | $147.25 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $211.65 | 4 | $846.60 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #10 - Deflector, Rock > 80 ton

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of large rock deflector (> 80tons) with or without log structures into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools ) are not currently present in the stream or are limited for aquatic species. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Rock deflctors, generally more than one, will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing a rock deflector into the channel from the stream bank. Stream habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Each Large Rock/Rocklog

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,880.04

**Scenario Cost/Unit:** $8,880.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 3 | $375.33 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 3 | $173.55 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 0.5 | $26.89 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 3.5 | $174.34 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 40 | $2,116.40 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 40 | $3,580.80 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 20 | $589.00 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $211.65 | 4 | $846.60 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #11 - Defector Group of 3 Root Wads

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of large wood structures, called root wads, supported by boulders in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools ) are not currently present in the stream or are limited for aquatic species. A project design for placement of habitat structures (boulders, boulder clusters, wood, wood structures) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood root wads placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required. Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing a group of 3 root wads anchored with boulders protruding along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Each group of 3

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,286.75

**Scenario Cost/Unit:** $3,286.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 6 | $750.66 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 6 | $631.68 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Materials** | | | | | | |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 6 | $537.12 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.68 | 9 | $96.12 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #12 - Cross Vane Rock or Rock/log

**Scenario Description:**

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of rocks or a combination of rocks and logs across the entire stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. Shape typically forms a "V" shape pointing upstream called a cross vane. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools ) are not currently present in the stream or are limited for aquatic species. A project design for placement of a cross vane will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.
Associated Practices: Critical Area Planting (342) and Streambank and Shoreline Protection ( 580)

**Before Situation:**

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

**After Situation:**

Stream habitat within the project reach is improving as a result of placing a 30' long rock or rock log cross vain accross the entire channel. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

**Feature Measure:** Each Cross vane

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,899.64

**Scenario Cost/Unit:** $4,899.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 4 | $500.44 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 4 | $231.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 30 | $1,587.30 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 6 | $537.12 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 20 | $15.60 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $211.65 | 4 | $846.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #1 - Concrete Dam Removal

**Scenario Description:**

Full or partial removal of a concrete or earthen dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The extent of removal (full or partial) is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect--to the fullest extent possible--pre-dam conditions. Pre-removal sediment assays are completed to determine the toxicity of sediment stored behind the dam. Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Alternative demolition techniques may include the use of high explosives, diamond-chain, or similar circular saws to remove the dam in a piecewise manner. Removed materials are trucked away and disposed or recycled off-site. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including canals, raceways, adjacent spillways, navigation locks, access and maintenance roads, or similar civil works. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

**Before Situation:**

A channel-spanning concrete dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish.

**After Situation:**

The existing dam is removed and reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Cubic Yards of concrete in dam and

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 250.00

**Scenario Total Cost:** $45,531.41

**Scenario Cost/Unit:** $182.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 1.5 | $486.29 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 20 | $2,018.80 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 60 | $7,983.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 60 | $3,471.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 6 | $2,562.12 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 80 | $8,422.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 220 | $10,958.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #2 - Earthen Dam Removal

**Scenario Description:**

Full removal of an earthen dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The removal extent is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect, to the fullest extent possible, pre-dam conditions. Pre-removal sediment assays are be completed as necessary to determine the toxicity of sediment stored behind the dam. Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the embankment can be used in site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including head gates, canals, raceways, access and maintenance roads, or similar civil works. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature. Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

**Before Situation:**

A channel-spanning earthen dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish.

**After Situation:**

The existing dam is removed and reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Cubic Yards of earthen embankme

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $37,173.42

**Scenario Cost/Unit:** $74.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 3 | $972.57 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 40 | $4,037.60 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 60 | $7,983.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 6 | $2,562.12 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 60 | $6,316.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 160 | $7,969.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #3 - Blockage Removal

**Scenario Description:**

Removal of passage barriers, including small relict earthen diversions (e.g., splash dams), failing or undersized culverts, and sediment or large woody material (>10cm diameter and 2m length) from mass wasting or major flood events. Instream material associated with the previously mentioned circumstances or structures prevents aquatic organism passage by the creation of channel-spanning blockages, or areas of shallow depth, high velocities, or extensive changes in water surface elevation. In addition, these features may encourage abrupt channel changes that endanger adjacent capital infrastructure or transportation corridors. Excessive streambank erosion by flows deflected around or impounded behind these features may impair water quality by introducing fine sediment out of phase with the natural hydrograph and the life history requirements of native aquatic species. Removal is done with an assortment of equipment, including tracked excavators outfitted with buckets with "thumbs", bull dozers, skid steers, front-end loaders, and dump trucks. The channel and adjacent floodplain are restored to pre-blockage conditions to the fullest extent practicable. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the blockage can be used in site reclamation. Large woody material, if present, is used for instream reclamation, replaced in the channel downstream of the blockage, or trucked offsite for disposal or stockpiling for future projects. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (643) Restoration and Management of Rare and Declining Habitats. ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

**Before Situation:**

An instream feature spanning the active channel creates hydraulic conditions that exceed the swimming or crawling abilities of native aquatic organisms. Event-driven mass wasting or instream deposits of coarse sediment create channel blockages or areas of shallow, fast-moving water. An instream plug of material transported to the site by flood flows or delivered to the channel from a hillslope failure not only blocks passage, but may deflect the stream toward a new course than endangers adjacent capital infrastructure or transportation corridors. Elevated risks associated with eventual over-topping or failure of the blockage to downstream features or communities are imminent in the event of a blockage that forms a temporary dam. Accelerated instream or lateral channel erosion may introduce fine sediment that impairs water quality.

**After Situation:**

The instream barrier is removed by a combination of methods and equipment and the channel and affected floodplain are restored to pre-blockage conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Cubic Yards of mineral sediment, fil

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $24,620.58

**Scenario Cost/Unit:** $123.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 40 | $2,128.40 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 20 | $2,018.80 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 20 | $2,661.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 20 | $1,157.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 2 | $854.04 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 40 | $4,211.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 20 | $1,023.20 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 140 | $6,973.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #4 - Nature-Like Fishway

**Scenario Description:**

Nature-like fishways, also known as roughened channels, rock ramps, or bypass channels, are constructed features that provide passage around an instream barrier or in place of a removed barrier. Fishway design is based on simulating or mimicking adjacent stream characteristics, using natural materials, and providing suitable passage conditions over a range of flows for a wide variety of fish species and other aquatic organisms. Nature-like fishways provide enhanced passage conditions compared to concrete or aluminum (Alaskan Steeppass) ladders, and are not as susceptible to debris-related operational issues. When used to bypass an instream barrier, they require a larger footprint than instream structures, and may also require control structures to regulate flow through the fishway or address tailwater fluctuations affecting the fishway entrance (downstream end). Fishway design includes an assessment of adjacent stream characteristics, including channel geometry, slope, sediment texture and composition, and major geomorphic units that govern channel plan, pattern and profile. In the case of a fishway that bypasses an instream barrier, the design is tailored to these elements, the elevation required to ascend the barrier, and the known range of flow variation or operations. For fishways constructed in the place of a removed barrier, the design may be a hybrid approach that meets the same criteria, although in a smaller instream footprint. Nature-like fishways are constructed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Large woody material is used to create channel structural elements in some settings, when available and where approved by oversight agencies. Removed materials are trucked away and disposed or recycled off-site, unless excavated native streambed material can be used in fishway construction. Large woody material or removed trees, if present, are used for fishway construction trucked offsite for disposal, or trucked offsite for stockpiling for future projects. Disturbed areas are revegetated with a mix of site-adapted species, and access control and signage are provided. Scenario does not include additional measures needed in the active channel and floodplain or at an existing dam necessary to control flow associated with nature-like fishway. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

**Before Situation:**

An instream barrier prevents upstream migration of native aquatic organisms and no support exists for removal. Similarly, an instream barrier is removed, and interested parties require maintenance of an upstream pool or pond. The subject stream contains a number of migrating aquatic organisms ranging in size from small to large with a range of propulsion abilities--weak to strong swimmers and animals that crawl along the bottom. In either case--barrier removal or bypassing an existing barrier--local sentiment to preserve existing or natural conditions and the desire to provide passage for a range of aquatic organisms indicate the use of a nature-like fishway. Adequate space for a bypass channel is available, and adjacent landowners approve.

**After Situation:**

A nature-like fishway is constructed in place of a removed barrier or around an existing barrier. The fishway is designed to mimic the adjacent natural stream, and is constructed of rock and/or large woody material that provides quality passage conditions for a number of species and geomorphic stability over a range of flows. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Acres of constructed fishway (bank

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $113,220.31

**Scenario Cost/Unit:** $113,220.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 3 | $972.57 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 12000 | $17,040.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 80 | $4,256.80 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 80 | $10,644.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 100 | $5,785.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 2 | $854.04 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 100 | $10,528.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |

| | | | | | | |
|---|---|---|---|---|---|---|
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 100 | $3,222.00 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 360 | $17,931.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 240 | $31,747.20 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 50 | $1,472.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #5 - CMP Culvert

**Scenario Description:**

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. CMPs used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, CMPs used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert size--diameter or span--is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert diameter or span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the CMP diameter or span is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and corrugations are determined by road loading requirements. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. . Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The culvert is placed within the roadway on a subexcavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Backfill depths are typically at least 20% of the culvert diameter or rise, but may deviate based on the shape of the culvert used, channel dimensions, substrate size, and the site longitudinal profile. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. Once the simulated streambed in the culvert barrel is complete, the roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

**Before Situation:**

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

**After Situation:**

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

**Feature Measure:** CMP

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $36,667.56

**Scenario Cost/Unit:** $36,667.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 900 | $1,278.00 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 40 | $5,322.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 60 | $3,471.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 1 | $427.02 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hours | $117.72 | 3 | $353.16 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 40 | $4,211.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 143 | $7,122.83 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 75 | $2,208.75 |
| Pipe, CMP, 96 in., 14 Gauge | 1835 | 96 inch Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only. | Feet | $117.26 | 40 | $4,690.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #6 - Bottomless Culvert

**Scenario Description:**

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. They commonly attach to preformed reinforced or poured-in-place concrete footings. Bottomless culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, bottomless culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert span is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the culvert span is determined, culvert length will be dictated by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and footing requirements are determined by road loading requirements and site geotechnical investigations. Generally, the preferred footing is a T-design with a spread footing with stem wall. Connecting the culvert leg to the footing can be done by welding, grouting, bolting. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. Bottomless arch or box culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. Footings are placed or poured, and the new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Once the simulated streambed between the footings is complete, the culvert sections are assembled and attached to the footings. Larger rock may be placed along the footing/culvert stemwall to project the connection from damage by transported bedload. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Scenario does not include concrete for head or wingwalls. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

**Before Situation:**

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

**After Situation:**

The undersized culvert is replaced with a bottomless arch or box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Multi-plate arch or box and rock fill

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $54,633.78

**Scenario Cost/Unit:** $54,633.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 900 | $1,278.00 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 40 | $5,322.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 60 | $3,471.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 1 | $427.02 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hours | $117.72 | 3 | $353.16 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 40 | $4,211.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 143 | $7,122.83 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 75 | $2,208.75 |
| Footing, concrete, precast | 1836 | Precast spread footing with stemwall, T-shaped, with channel built to accept arched culvert leg. Includes materials only. | Feet | $85.20 | 80 | $6,816.00 |
| Geocell, 6 inch | 1842 | 6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill. | Square Yard | $32.18 | 500 | $16,090.00 |
| Culvert, Multi-Plate arch | 1979 | Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings. | Pound | $2.09 | 1 | $2.09 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #7 - Concrete Box Culvert

**Scenario Description:**

A four-sided precast concrete box (square or rectangular) culvert used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. Concrete box culverts are generally available in sections of 1-foot increments. Concrete box culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, concrete box culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert width is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert width is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Once the culvert width is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined. Concrete box culverts are delivered in sections and assembled onsite, and require adequate bed compaction throughout the crossing section. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

**Before Situation:**

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

**After Situation:**

The undersized culvert is replaced with a concrete box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Concrete box culvert and rock fill

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $64,652.89

**Scenario Cost/Unit:** $64,652.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 1000 | $1,420.00 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 40 | $5,322.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 60 | $3,471.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 1 | $427.02 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hours | $117.72 | 3 | $353.16 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 40 | $4,211.20 |
| **Labor** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 143 | $7,122.83 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 75 | $2,208.75 |
| Culvert, box, 6 ft x 6 ft | 1837 | Precast concrete box culvert, 6 feet x 6 feet. Typically in 4 foot sections. Includes materials only. | Feet | $417.38 | 40 | $16,695.20 |
| Geocell, 6 inch | 1842 | 6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill. | Square Yard | $32.18 | 500 | $16,090.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #8 - Bridge

**Scenario Description:**

A channel-spanning structure that carries a road or trailway across a river or stream. Constructed of timber, i-beams, or concrete, bridges are attached at either end to prefabricated, reinforced and poured-in-place, or piling abutments capped/surrounded with concrete. Longer span bridges may require instream pilings to support the travel surface. Bridge decking can be timber, concrete, asphalt, or some combination thereof. Bridge design is completed to conform to loading requirements and site conditions. Geotechnical investigations are used to determine the best support structure suited to a given site. The bridge deck is designed to rest on abutments placed on the adjacent floodplain. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert (if applicable), and topsoil conservation for site reclamation. Stream diversion is not necessary since the bridge will be constructed above the active channel. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

**Before Situation:**

An existing stream crossing outfitted with an undersized culvert has a history of maintenance issues and failure. The downstream channel has experienced bed and bank scour, and the crossing may have to the deposition of a wedge of sediment upstream of the road. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

**After Situation:**

The undersized culvert is replaced with a timber bridge placed on precast concrete abutments. The bridge deck is composed of timber planks, and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Linear feet of bridge deck

**Scenario Unit:** Feet

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $119,639.47

**Scenario Cost/Unit:** $3,987.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 100 | $54,030.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 40 | $2,128.40 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 40 | $5,322.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 60 | $3,471.00 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 40 | $5,969.60 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 40 | $4,211.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 140 | $6,973.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 120 | $15,873.60 |
| **Materials** | | | | | | |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 1000 | $2,390.00 |
| Steel, structural steel members | 1779 | Structural steel, includes materials and fabrication. | Pound | $2.27 | 5360 | $12,167.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #9 - Concrete Ladder

**Scenario Description:**

Formed, reinforced, poured-in-place concrete structures outfitted with baffles (Denil), vertical slots, pools and weirs, submerged orifices, chutes or some combination thereof to provide upstream passage for aquatic organisms over dams and other hydraulic structures. Although fish ladder designs vary according to target species and site conditions, they can generally be described as a three-sided concrete channel with integrated hydraulic features that provide a gradual elevation increase across some distance that allows aquatic organism to swim over a barrier--they convert the total barrier head elevation into passable increments. Concrete ladders are often constructed with resting pools and may have switchbacks. The primary water source for a concrete ladder comes from streamflow diverted into the ladder exit (upstream end) and since it is passed through the ladder to the river below, it is not a consumptive use. These ladders often require flow control and regulating devices (sometimes automated), gates, and may need auxiliary pumps to provide attraction flows at the ladder entrance (downstream end) or augment flow in the ladder. Gages above and below the dam are required to inform ladder operation. Trash racks are used at the upstream end to block debris from entering the ladder. Concrete ladders also require frequent maintenance, and flow through unautomated ladders may need to be adjusted manually when adjacent river conditions or dam operations change. Concrete ladder designs can be complex and require interactions between engineering and ecological sciences for successful implementation. For example, the ladder entrance is one of the most important elements of the structure, and placement of this entrance in the downstream reach is a function of site characteristics and aquatic organism biology. In addition, some aquatic animals will not swim through a submerged orifice, so use of pool-orifice ladders is not recommended. Partners associated with dam ownership and operation, regulatory agencies, and others are consulted and included in the design and construction process. Ladder designs account for run volume and timing, and the swimming capabilities of target species. Some ladders in highly visible areas are finished with masonry facades to blend the ladder to the site in the interest of aesthetics or to conform with historic appearances. Concrete ladders are constructed with equipment for excavation, placing material, and delivering and removing material. Lifts or booms are required to place concrete into forms. Because ladders are often attached to existing dams, personnel familiar with the dam structure are involved at all phases of the process to ensure that plans conform with site requirements. Bed and bank excavation are necessary to create the location for concrete ladders, so site isolation and sediment and erosion control measures are used. Disturbed areas are revegetated with a mix of site-adapted species, and access control and signage are provided. Scenario does not include additional measures in the adjacent active channel necessary to control flow, address channel elevation or stability, or encourage fish guidance into the concrete ladder. Scenario does not include structures used as counting stations or to trap and sample upstream migrants. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

**Before Situation:**

An operational, low hazard class fixed crest concrete dam becomes the target of parties interested in providing fish passage. The dam presently blocks the upstream migration of a number of native aquatic organisms, and suitable spawning and rearing habitats for targeted fish species exists in upstream river reaches. Assessment of site conditions, dam operation, and target species swimming abilities indicate that a concrete ladder will provide suitable passage conditions during the migration season and pass the expected run volume without excessive delays.

**After Situation:**

A concrete pool and chute ladder outfitted with aluminum internal features and 2 turn/resting pool is installed. The ladder is attached to the face and abutment of the dam, and the entrance is located along the streambank where migrating aquatic organisms are likely to encounter it. The ladder passes the estimated run volume with minimal delays, and native aquatic animals are able to reach upstream spawning and rearing areas and successfully produce offspring that become part of the population. The ladder has an operating plan that stipulates actions and responsible parties for every month of the year. The ladder is fenced to control access and signage indicating its function and relevant warnings is provided at numerous locations. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Barrier height (feet)

**Scenario Unit:** Feet

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $362,892.09

**Scenario Cost/Unit:** $18,144.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 500 | $270,150.00 |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 3 | $972.57 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 60 | $3,192.60 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 80 | $10,644.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 80 | $4,628.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 6 | $2,562.12 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 60 | $8,954.40 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 60 | $6,316.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 240 | $11,954.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 80 | $4,280.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 240 | $31,747.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #12 - Low Water Crossing

**Scenario Description:**

Structure installed on low volume or on unimproved roads at watercourse crossings. Primary use is to allow livestock and equipment access to other parcels of land or operational units. Low-water crossings provide safe and stable stream crossings that don't negatively impact water and ecological quality while remaining stable across a wide range of flows. Variations exist, but a common application consists of an improved or hardened ford located above a hydraulic control (e.g., bedrock outcropping, riffle, or step composed of coarse substrates). Properly designed and installed low water crossings provide aquatic organism passage (AOP), promote stream ecological and geomorphic function, remain stable over time, and can pass sediment and woody debris. Conservation planning and interaction with the landowner is vital to determine if existing crossings can be consolidated into fewer, more reliable locations. Characterizing a site according to its watershed position and geomorphic function will aid design decisions. Optimal AOP conditions are usually realized when the backfill is composed of a mixture that mimics bed material as evaluated from a reference reach adjacent to the crossing—preferably at least 10-20 estimated bankfull channel widths above an existing crossing to avoid effects that alter channel geometry or bedform composition and spacing. Low water crossings are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Low water crossings provide the best mix of function and longevity when they are designed and built to conform to existing channel geometry and slope, constructed to match the shape of the existing channel, and oriented to cross the stream at a 90 degree angle. Crossing width, measured along the downstream axis, should not exceed 2X bankfull width. Low water crossings are commonly constructed by overexcavating the crossing section 6-12 inches below the existing streambed and backfilling the void with well-graded rock back to natural bed elevation. Geotextile lining may be required in some settings. Rock size and gradation is the smallest mix needed to remain stable under prevailing flow conditions—larger rock can endanger livestock and turbulence impairs passage. Sand or soil may be added into the mix to seal the section to ensure that the stream doesn't percolate into the crossing substrate. Smaller material increases bed diversity, chokes voids between bigger stones, and helps preserve passage quality. Smaller rock smaller (< 2 inches) at the finished surface may become lodged in livestock hooves. The road/trail surface of the crossing should be extended to an elevation that exceeds the known high water level on each side of the crossing. The downstream edge of the crossing should not produce a sharp drop in water surface to preserve AOP quality and discourage sediment deposition and debris accumulation. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Stream corridor fencing should be considered to control livestock access and preserve water and riparian quality. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

**Before Situation:**

A small farming operation has a mixture of pastures, hay meadows, and crops that all require seasonal movement of equipment and livestock between parcels. Four unimproved stream crossings provide unreliable access across the property and require yearly maintenance to clear debris and sediment. Farm equipment has gotten stuck in the past, and uncontrolled livestock access and frequent crossing or loafing in the stream contributes to chronic water quality problems associated with elevated fine sediment, high water temperatures, invasive aquatic vegetation, and fecal coliform bacteria. Livestock avoid three of the crossings when streamflow increases moderately. Two of the crossings are overwide and shallow, and impair AOP. The property and landowner's yearly operations are reviewed by conservation planners and—with the input and agreement of the landowner—it is decided that three of the four crossings can be eliminated and consolidated at one site above a cobble/boulder deposit in the stream.

**After Situation:**

An improved ford is constructed by excavating the channel just upstream of the boulder/cobble hydraulic control. The cut is lined with geotextile to control seepage and subsurface flow, and backfilled up to the existing bed elevation with a well-graded mix of rock sized to mimic the material in the channel upstream of the crossing. The finished crossing surface is at grade with the up and downstream channel elevation, and no drop exists along the downstream edge. Approaches on either side of the crossing are extended up to the adjacent floodplain surface, and the finished instream portion of the ford matches the existing channel cross section. Approach slopes are shallow enough for expected equipment traffic, including towed combinations, and armored as needed with larger rock to protect against erosion that may occur when the floodplain is inundated. The crossing is fenced and gated to control livestock access and provide greater flexibility to the landowner's grazing needs. AOP is provided, and the crossing remains stable across a range of flow and sediment and debris transport events. Resource Concerns are addressed within the context of the site.

**Feature Measure:** Cubic Yard

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 60.00

**Scenario Total Cost:** $47,730.07

**Scenario Cost/Unit:** $795.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 0.5 | $162.10 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 1000 | $1,420.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 50 | $320.50 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 80 | $4,256.80 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 60 | $7,983.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 80 | $4,628.00 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hours | $117.72 | 3 | $353.16 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 40 | $4,211.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 263 | $13,100.03 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 75 | $2,208.75 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #13 - Paddlewheel Screen

**Scenario Description:**

A fish screen used at surface (gravity) diversions intended to prevent juvenile or small-bodied adult fish from entering ditches, canals, laterals or other pathways that lead to migration dead-ends or sources of mortality. Paddlewheel screens are active by design, meaning that they are outfitted with mechanisms that automatically cycle to keep the screen free of debris that will restrict the screen area, impede flow through the screen, and may cause the screen to fail. These screens are powered by a paddlewheel driven by flowing water and are thus suitable for remote locations without electrical services. Paddlewheel screens can be installed in the active channel along a streambank, but are most commonly built in a canal below a diversion structure. Aquatic organisms that encounter a screen installed in a canal are diverted back into the adjacent stream through a buried pipe. Screens installed in the active channel are built at the point of diversion with the screen face aligned parallel to the flow of the river. Bankline modifications can be necessary to achieve proper alignment. Screens installed in a canal can be aligned differently and are best sited at a canal location that minimizes the straight-line bypass/return path distance. Again, canal installation is the most common. A fully functional screen is designed to meet criteria intended to protect target organisms from being swept into and pinned against or along the screen face (impingement). When this occurs, animals can be physically harmed or, in the case of a rotating drum screen, introduced into the diversion works behind the screen. Active screens are designed to ensure that the approach velocity will not exceed .4 feet per second (fps). Approach velocity is calculating by dividing the maximum screened flow volume by the vertical projection of the effective screen area at maximum submergence. For a rotating drum screen the design submergence should not be more than 85% or less than 65% of the screen diameter. Screen design should strive to provide nearly uniform flow distribution across the screen surface. Screens longer than 6 feet must be angled to the direction of incoming flow and have sweeping velocities (along the face of the screen) greater than the approach velocity, and sweeping velocities should not decrease along the face of the screen. Screen face openings must not exceed 3/32 inch in diameter, and perforated plate must be smooth to the touch with openings punched through in the direction of approaching flow. Material used for the screen face should be corrosion resistant and sufficiently durable to maintain a smooth uniform surface with long term use. Bypass design flow should be about 5% of the diverted amount, include an easily accessible entrance, and flow velocity in the bypass pipe or channel should not exceed 0.2fps. Minimum design depth in a bypass pipe should be at least 40% of the pipe diameter. Bypass entrances should be installed with independent flow control capability. The face of all screen surfaces must be placed flush (to the extent possible) with any adjacent screen bay, pier noses, and walls to allow fish unimpeded movement parallel to the screen face and ready access to bypass routes. Paddlewheel screens are generally fabricated at a machine shop and delivered to the project site. Site conditions may require the construction of a small concrete headwall that will anchor the screen and may be outfitted with flow control that to adjust hydraulic conditions and optimize screen function. In addition, concrete training walls to conduct flow into, through, and below the screen may be required at some sites. Paddlewheel screens are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. A crane or boom truck may be needed to place the screen assembly. Other actions include construction staking and signage, soil erosion and pollution control, access control and fencing, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, or factors associated with channel improvements at the bypass pipe outfall. Final contracts stipulate entities and schedules for operation and maintenance. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

**Before Situation:**

An unscreened gravity diversion removes water and fish from a small stream. The ditch under the 5 cfs diversion serves a number of pumps and turnouts used to irrigate alfalfa and flood irrigate hay. The diversion is run from late winter into fall, although the flood irrigated crops are shut off in mid-summer to allow growth and prepare the fields for mowing and haying. Although the diversion is owned by a nth-generation landowner with proven, long-standing rights to the diverted water, recent fish listings under the Endangered Species Act present liability risks in the face of a third party lawsuit. Diverted listed fish are killed in residual depressions in the irrigated meadow, and often become entrained and killed in pumps used to drive wheel lines used to irrigate alfalfa.

**After Situation:**

A modular rotating drum paddlewheel screen is installed in the ditch about 100 feet downstream of the diversion dam. The screen is outfitted with a screw-gated 10-inch smooth HDPE pipe buried below the floodplain that connects the bypass entrance to a deep pool in the adjacent stream. The screen is placed on an excavated bed backfilled with compacted sand and gravel, and bolted to a small reinforced poured-in-place concrete headwall. Inspection during the first operational season following construction confirms that the screen is within hydraulic criteria and providing adequate protection to listed fish. The screen structure is fenced from livestock, and inspected and maintained according to contractual agreements. Resource Concerns are addressed within the context of the site.

**Feature Measure:** GPM

**Scenario Unit:** Gallons per Minute

**Scenario Typical Size:** 2,244.00

**Scenario Total Cost:** $54,146.78

**Scenario Cost/Unit:** $24.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 15 | $8,104.50 |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 1 | $324.19 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 20 | $128.20 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 40 | $5,322.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 40 | $2,314.00 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 32 | $4,775.68 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 32 | $3,368.96 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 112 | $5,578.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 120 | $15,873.60 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 2 | $2.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 396 - Aquatic Organism Passage

**Scenario** #14 - Rotating Drum Screen

**Scenario Description:**

A fish screen used at surface (gravity) diversions intended to prevent juvenile or small-bodied adult fish from entering ditches, canals, laterals or other pathways that lead to migration dead-ends or sources of mortality. Rotating drum screens are active by design, meaning that they are outfitted with mechanisms that automatically cycle to keep the screen free of debris that will restrict the screen area, impede flow through the screen, and may cause the screen to fail. These screens are powered electric motors that rotate a drum covered in fine stainless steel mesh. The drum rotates in the direction of the incoming flow, and is designed to protect fish from entrainment into the diversion while at the same time rolling fine debris attached to the screen face into the ditch or canal below. Rotating drum screens can be installed in the active channel along a streambank, but are most commonly built in a canal below a diversion structure. . Aquatic organisms that encounter a screen installed in a canal are diverted back into the adjacent stream through a buried pipe. Screens installed in the active channel are built at the point of diversion with the screen face aligned parallel to the flow of the river. Bankline modifications can be necessary to achieve proper alignment. Screens installed in a canal can be aligned differently and are best sited at a canal location that minimizes the straight-line bypass/return path distance. Again, canal installation is the most common. A fully functional screen is designed to meet criteria intended to protect target organisms from being swept into and pinned against or along the screen face (impingement). When this occurs, animals can be physically harmed or, in the case of a rotating drum screen, introduced into the diversion works behind the screen. Active screens are designed to ensure that the approach velocity will not exceed .4 feet per second (fps). Approach velocity is calculating by dividing the maximum screened flow volume by the vertical projection of the effective screen area at maximum submergence. For a rotating drum screen the design submergence should not be more than 85% or less than 65% of the screen diameter. Screen design should strive to provide nearly uniform flow distribution across the screen surface. Screens longer than 6 feet must be angled to the direction of incoming flow and have sweeping velocities (along the face of the screen) greater than the approach velocity, and sweeping velocities should not decrease along the face of the screen. Screen face openings must not exceed 3/32 inch in diameter, and perforated plate must be smooth to the touch with openings punched through in the direction of approaching flow. Material used for the screen face should be corrosion resistant and sufficiently durable to maintain a smooth uniform surface with long term use. Bypass design flow should be about 5% of the diverted amount, include an easily accessible entrance, and flow velocity in the bypass pipe or channel should not exceed 0.2fps. Minimum design depth in a bypass pipe should be at least 40% of the pipe diameter. Bypass entrances should be installed with independent flow control capability. The face of all screen surfaces must be placed flush (to the extent possible) with any adjacent screen bay, pier noses, and walls to allow fish unimpeded movement parallel to the screen face and ready access to bypass routes. Rotating drum screens are composed of elements fabricated at a machine shop and delivered to the project site, or built onsite. They are generally part of a reinforced, poured-in-place mass of concrete that forms a three-sided section above, around, and below the screen. Onsite derricks or metal framework can be required above screen bays to facilitate lifting drums for maintenance and inspection of side and bottom seals. Rotating drum screens may need to be fitted with flow control devices that to adjust hydraulic conditions and optimize screen function. Rotating drum screens are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. A crane or boom truck may be needed to place elements of larger screen installations, including gates, drums, and overhead metal framework. Other actions include construction staking and signage, soil erosion and pollution control, access control and fencing, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, or factors associated with channel improvements at the bypass pipe outfall. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information. ---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

**Before Situation:**

An unscreened gravity diversion removes water and fish from a medium-sized stream. The ditch under the 75 cfs diversion serves a number of pumps and turnouts used to irrigate alfalfa and flood irrigate hay. The diversion is run from late winter into fall, although the flood irrigated crops are shut off in mid-summer to allow growth and prepare the fields for mowing and haying. Although the diversion is owned by a nth-generation landowner with proven, long-standing rights to the diverted water, recent fish listings under the Endangered Species Act present liability risks in the face of a third party lawsuit. Diverted listed fish are killed in residual depressions in the irrigated meadow, and often become entrained and killed in pumps used to drive wheel lines used to irrigate alfalfa.

**After Situation:**

A rotating drum screen consisting of three 8-foot wide, 4-foot diameter drums each driven by a 5hp electric motor is installed in the ditch about 200 feet downstream of the diversion dam. The screen is outfitted with a screw-gated 20-inch smooth HDPE pipe buried below the floodplain that connects the bypass entrance to a deep pool in the adjacent stream. The screen is placed in a concrete section extending above, underneath and below the drum location that forms the structure holding the drums, side and bottom seals, bypass entrance, and screen fore and afterbay. A steel I-beam structure is erected to form continuous overhead cover above the screen bays, and outfitted with a traveling electric winch used to raise each drum for periodic maintenance and seal inspection. Inspection during the first operational season following construction confirms that the screen is within hydraulic criteria and providing adequate protection to listed fish. The screen structure is fenced from livestock, and inspected and maintained according to contractual agreements. Resource Concerns are addressed within the context of the site.

**Feature Measure:** GPM

**Scenario Unit:** Gallons per Minute

**Scenario Typical Size:** 33,660.00

**Scenario Total Cost:** $100,334.02

**Scenario Cost/Unit:** $2.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 100 | $54,030.00 |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 1 | $324.19 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 50 | $320.50 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 40 | $5,322.00 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 40 | $2,314.00 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 32 | $4,775.68 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 32 | $3,368.96 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 112 | $5,578.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 120 | $15,873.60 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 2 | $2.00 |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 397 - Aquaculture Pond

**Scenario** #1 - Aquaculture Pond

**Scenario Description:**

Typical practice is 1 acre pond surface area, 3:1 side slopes, average 5' depth. The construction of a aquaculture pond to facilitate the efficient collection and transfer of waste, the containment of cultured fish, efficient use of water and the maintenance of water quality. The resorce concerns addressed include excess nutrients in surface and ground waters, inefficient water use, and habitat degradation. Typical pond outlet shall is Structure for Water Control (587). Costs include all equipment necessary to excavate, grade and shape an aquaculture pond. Water Control Structure and Seeding not included.

**Before Situation:**

In the before situation, an aquaculture producer has an aquaculture pond system that one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

**After Situation:**

Aquaculture pond is typically 1 acre in surface area, 5 feet deep with 3:1 side slopes. The practice is installed using a dozer. Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). Liner if needed will be installed using Pond Sealing (521 A, B, C, or D). Water Well, Pumps, and Access Roads may also be needed and will be installed using those standards as appropriate.

**Feature Measure:** Acre of Aquaculture Pond

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $27,498.65

**Scenario Cost/Unit:** $27,498.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 6990 | $26,911.50 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 397 - Aquaculture Pond

**Scenario** #2 - With Kettle

**Scenario Description:**

Typical practice is 1 acre pond surface area, 3:1 side slopes, average 5' depth with a harvest kettle constructed with 10 CY of reinforced concrete. The construction of a aquaculture pond to facilitate the efficient collection and transfer of waste, the containment of cultured fish, efficient use of water and the maintenance of water quality. The resorce concerns addressed include excess nutrients in surface and ground waters, inefficient water use, and habitat degradation. Typical pond outlet shall is Structure for Water Control (587). Costs include all equipment necessary to excavate, grade and shape an aquaculture pond, and reinforce concrete “kettle”. Water Control Structure and Seeding not included.

**Before Situation:**

In the before situation, an aquaculture producer has an aquaculture pond system that one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

**After Situation:**

Aquaculture pond is typically 1 acre in surface area, 5 feet deep with 3:1 side slopes with a reinforced concrete harvest kettle. The practice is installed using a dozer. Reinforce concrete harvest kettle is installed with laborers. Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). Liner if needed will be installed using Pond Sealing (521 A, B, C, or D). Water Well, Pumps, and Access Roads may also be needed and will be installed using those standards as appropriate.

**Feature Measure:** Acre of Aquaculture Pond

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $34,256.15

**Scenario Cost/Unit:** $34,256.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 10 | $5,403.00 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 6990 | $26,911.50 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 100 | $239.00 |
| Wire Mesh Screen, galvanized, 1/16 in | 1229 | Wire Mesh Screen, galvanized, 1/16 inch grid spacing. Materials only. | Square Feet | $4.28 | 140 | $599.20 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 397 - Aquaculture Pond

**Scenario** #3 - With Rock Bottom

**Scenario Description:**

Typical practice is 1 acre pond surface area, 3:1 side slopes, average 5' depth with a 6" gravel placed in pond bottom as required for certain species of fish. The construction of a aquaculture pond to facilitate the efficient collection and transfer of waste, the containment of cultured fish, efficient use of water and the maintenance of water quality. The resorce concerns addressed include excess nutrients in surface and ground waters, inefficient water use, and habitat degradation. Typical pond outlet shall is Structure for Water Control (587). Costs include all equipment necessary to excavate, grade and shape an aquaculture pond and furnishing and placing gravel. Water Control Structure and Seeding not included.

**Before Situation:**

In the before situation, an aquaculture producer has an aquaculture pond system that one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

**After Situation:**

Aquaculture pond is typically 1 acre in surface area, 5 feet deep with 3:1 side slopes with 6” of gravel on the bottom. The practice is installed using a dozer. Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). Liner if needed will be installed using Pond Sealing (521 A, B, C, or D). Water Well, Pumps, and Access Roads may also be needed and will be installed using those standards as appropriate.

**Feature Measure:** Acre of Aquaculture Pond

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $51,436.64

**Scenario Cost/Unit:** $51,436.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 7581 | $29,186.85 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 690 | $21,493.50 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 398 - Fish Raceway or Tank

**Scenario** #3 - Fish Raceway-Single

**Scenario Description:**

The construction of a concrete fish raceway to facilitate the collection of wastes, the containment of cultured fish, and to maintain water quality. Typical practice is a 100' long x 6' wide x 3.5' deep concrete raceway with a quiescent zone for waste collection and sloped floors as per the conservation practice standard. This scenario includes all necessary labor and materials for excavation, aggregate, cast-in-place concrete, fish screens, weir boards, and concrete sealing with epoxy paint.

**Before Situation:**

In the before situation, an aquaculture producer has an aquaculture production system with one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.Fish raceway is typically 2,100 cubic feet in size (100'x6'x3.5') with 0.8' thick slab and 0.8' thick walls of cast in place, reinforced concrete. The practice is installed using a hydraulic excavator, and concrete pump truck. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Inlets and outlets, if needed will be installed using Structure for Water Control (587). Pipeline, Pumping Plant, Water Well, and Access Roads may also be needed and will be installed using those standards as appropriate.

**After Situation:**

Fish raceway is typically 2,100 cubic feet in size (100'x6'x3.5') with 0.8' thick slab and 0.8' thick walls of cast in place, reinforced concrete. The practice is installed using a hydraulic excavator, and concrete pump truck. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Inlets and outlets, if needed will be installed using Structure for Water Control (587). Pipeline, Pumping Plant, Water Well, and Access Roads may also be needed and will be installed using those standards as appropriate.

**Feature Measure:** Cubic Foot of Raceway

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 2,100.00

**Scenario Total Cost:** $50,837.08

**Scenario Cost/Unit:** $24.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 52 | $28,095.60 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 284 | $403.28 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 16 | $925.60 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 24 | $3,581.76 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.79 | 862 | $4,128.98 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 2 | $62.30 |
| Irrigation, Screen | 329 | Screen device to prevent debris, fish or other wildlife from being drawn into irrigation systems. Types include self cleaning rotary drum, pump suction, or flat panel screens. Includes materials only. | Gallons per Minute | $5.61 | 1200 | $6,732.00 |
| Dimension Lumber, untreated | 1045 | Untreated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners. | Board Feet | $2.08 | 54 | $112.32 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 1342 | $1,476.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 398 - Fish Raceway or Tank

**Scenario** #6 - Fish Raceway-Parallel

**Scenario Description:**

The construction of a concrete fish raceway to facilitate the collection of wastes, the containment of cultured fish, and to maintain water quality. Typical practice is side by side 100' long x 6' wide x 3.5' deep concrete raceway with a quiescent zone for waste collection and sloped floors as per the conservation practice standard. This scenario includes all necessary labor and materials for excavation, aggregate, cast-in-place concrete, fish screens, weir boards, and concrete sealing with epoxy paint.

**Before Situation:**

In the before situation, an aquaculture producer has an aquaculture production system with one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

**After Situation:**

Fish raceway is typically 4,480 cubic feet in size (100'x12.8'x3.5') with 0.8' thick slab and 0.8' thick walls of cast in place, reinforced concrete. The practice is installed using a hydraulic excavator, and concrete pump truck. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Inlets and outlets, if needed will be installed using Structure for Water Control (587). Pipeline, Pumping Plant, Water Well, and Access Roads may also be needed and will be installed using those standards as appropriate.

**Feature Measure:** Cubic Foot of Fish Raceway

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 4,480.00

**Scenario Total Cost:** $84,400.29

**Scenario Cost/Unit:** $18.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 87 | $47,006.10 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 374 | $531.08 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 24 | $1,388.40 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 24 | $3,581.76 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.79 | 1056 | $5,058.24 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 24 | $816.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 73 | $2,273.95 |
| Irrigation, Screen | 329 | Screen device to prevent debris, fish or other wildlife from being drawn into irrigation systems. Types include self cleaning rotary drum, pump suction, or flat panel screens. Includes materials only. | Gallons per Minute | $5.61 | 2400 | $13,464.00 |
| Dimension Lumber, untreated | 1045 | Untreated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners. | Board Feet | $2.08 | 108 | $224.64 |
| Painting, porous surface, impermeable | 1497 | Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application. | Square Feet | $1.10 | 2684 | $2,952.40 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 399 - Fishpond Management

**Scenario** #1 - Invasive Weed Chemical

**Scenario Description:**

Chemical application to existing fishpond to remove invasive or undesired vegetation. Typically use Diquat dibromide or other appropriate herbicide. Chemical control will be applied by a certified pesticide applicator per state code. Resource concerns addressed include: Degraded Plant Condition - Excessive plant pest pressure; Degraded Plant Condition - Inadequate structure and composition; Inadequate Habitat for Fish and Wildlife - Habitat degradation.

**Before Situation:**

Existing fishpond is negatively impacted by invasive vegetation. Invasive vegetation is reducing availability of resources for desired fish species.

**After Situation:**

Chemical application has been completed to manage the invasive vegetation. Resource concerns have been addressed. Participant will follow Operation and Maintenance guidance to ensure control has been achieved through regular monitoring and will address any negative impacts to ensure an invasion does not occur again within the lfiespan of the practice.

**Feature Measure:** Acre of pond managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $338.76

**Scenario Cost/Unit:** $338.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| **Materials** | | | | | | |
| Herbicide, Diquat dibromide | 1820 | Aquatic herbicide and plant growth regulator. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Gallons | $135.88 | 1 | $135.88 |

**Practice:** 399 - Fishpond Management

**Scenario** #2 - Habitat Structures

**Scenario Description:**

Fishpond lacks a diversity of habitat to provide adequate habitat for desired fish species. Creation of habitat structures as recommended by conservation planner or other individual with appropriate credentials. Suggested improvements will determine type of structure needed, number of structures, density and location of structures. Habitat structures are typically submerged or emergent. Structures may include log cribs, rock piles, log and rock cribs, pipe and limber cribs, conifer cribs, PVC-tree structures, gravel spawning beds, catfish cages, concrete blocks stacked and filled with sticks or cuttings or plastic barrels filled with sand and sticks. Resource Concerns addressed include: Inadequate Habitat for Fish and Wildlife - Habitat degradation. Practice installation may also address: Water Quality Degradation - Elevated water temperatures.

**Before Situation:**

Existing fish pond lacks sufficent habitat diversity to provide optimum conditions for desired fish species.

**After Situation:**

Habitat structures within fishpond are appropriate for desired fish species. Typical installation in 1 ac pond: 12 structures of 24 concrete blocks stacked and wired together, with sticks placed within blocks. Resource concerns have been addressed. Participant will follow Operation and Maintenance guidance to ensure created habitat is maintained and continues to provide the benefits to the resources.

**Feature Measure:** Acre of pond managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,111.66

**Scenario Cost/Unit:** $6,111.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 12 | $296.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 144 | $4,639.68 |
| **Materials** | | | | | | |
| Block, concrete | 253 | Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only | Each | $2.32 | 288 | $668.16 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 3 | $507.42 |

**Practice:** 399 - Fishpond Management

**Scenario** #3 - Aerator surface

**Scenario Description:**

Aerator added to existing fishpond to obtain desired oxygen levels. Typically 1 aerator needed per pond. Certain oxygen levels in the fishpond are needed for optimum vegetation, habitat and water quality. Oxygen levels and size of aerator needed are determined by a conservation planner, engineer or per existing supported data. Aerator planning and placement specifications can be found in "AEN-3: Aeration of ponds used in aquaculture". Resource concerns addressed include: Inadequate Habitat for Fish and Wildlife - Habitat degradation; Water Quality Degradation - Elevated water temperature.

**Before Situation:**

Existing fishpond has insufficent levels of oxygen available for desired fish species in pond. Habitat and water quality degraded, as well as health of the fish population.

**After Situation:**

Aerator sized appropriately for fishpond has been established and oxygen is at an optimum level. Participant will follow Operation and Maintenance guidance to ensure aerator maintained to continually provide appropriate oxygen levels for fishpond.

**Feature Measure:** Acre of pond managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,791.39

**Scenario Cost/Unit:** $1,791.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Post, Steel T, 1.33 lbs, 10 ft. | 17 | Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only. | Each | $14.19 | 2 | $28.38 |
| Aerator, pond, 1 hp | 1708 | 1 hp Aerator for pond or tank with less than 10 acres of surface area. Materials only. | Each | $1,480.03 | 1 | $1,480.03 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 399 - Fishpond Management

**Scenario** #4 - Aerator subsurface

**Scenario Description:**

Aerator added to existing fishpond to obtain desired oxygen levels. Typically 1 aerator needed per pond. Certain oxygen levels in the fishpond are needed for optimum vegetation, habitat and water quality. Oxygen levels and size of aerator needed are determined by a conservation planner, engineer or per existing supported data. Aerator planning and placement specifications can be found in "AEN-3: Aeration of ponds used in aquaculture". Resource concerns addressed include: Inadequate Habitat for Fish and Wildlife - Habitat degradation; Water Quality Degradation - Elevated water temperature. Associated Practice: Critical Area Planting - 342

**Before Situation:**

Existing fishpond has insufficent levels of oxygen available for desired fish species in pond. Habitat and water quality degraded, as well as health of the fish population.

**After Situation:**

Aerator sized appropriately for fishpond has been established and oxygen is at an optimum level. Participant will follow Operation and Maintenance guidance to ensure aerator maintained to continually provide appropriate oxygen levels for fishpond.

**Feature Measure:** Acre of pond managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,042.03

**Scenario Cost/Unit:** $4,042.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 8 | $20.48 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Post, Steel T, 1.33 lbs, 10 ft. | 17 | Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only. | Each | $14.19 | 2 | $28.38 |
| Pipe, PVC, 3 in., SCH 40 | 977 | Materials: - 3 inch - PVC - SCH 40 - ASTM D1785 | Feet | $4.67 | 50 | $233.50 |
| Aerator - subsurface | 1821 | Aeration system, ponds, subsurface air. Includes materials and shipping. | Each | $3,307.55 | 1 | $3,307.55 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 399 - Fishpond Management

**Scenario** #5 - Native Vegetation

**Scenario Description:**

Native, aquatic vegetation will be established by plugs and or tubers. Both emergent and submerged vegetation will be established using hand tools or other small equipment as needed. Vegetation will be established to ensure approprite cover for desired fish species. Plants will be established at a rate, location and density as prescribed by the conservation planner or other resource. A typical setting will plant between 2-5 aquatic plants per 10 SF. This scenario may include replacing of non desired plants with appropriate native plants. Resource Concerns addressed include: Degraded Plant Condition - Excessive plant pest pressure; Inadequate Habitat for Fish and Wildlife - Habitat degradation. Practice installation may also address: Water Quality Degradation - Elevated water temperatures.

**Before Situation:**

Established fish pond which has had insufficient vegetation for desired fish species. Vegetation consists either primarily of non-desired plants or is not of a density to provide adequate cover for fish species. Fishpond is typically 1 acre in size, 1/4 acre of fishpond will receive native vegetation restoration.

**After Situation:**

Vegetation in fishpond is of a density and composition that is suitable for desired fish species. Vegetation is native plants. Resource concerns have been addressed. Participant will follow Operation and Maintenance guidelines to ensure established plants will thrive. If plant die-off occurs prior to lifespan of practice, participant is required to re-establish vegetation to NRCS Standards and Specifications.

**Feature Measure:** Acre of vegetation planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,405.80

**Scenario Cost/Unit:** $3,405.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| **Materials** | | | | | | |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $0.99 | 2178 | $2,156.22 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 399 - Fishpond Management

**Scenario** #6 - Depth Management

**Scenario Description:**

Management of existing fishpond by excavation or placement of material to create deep open water or littoral shelves. Fishpond currently does not provide optimum habitat for desired species. Excavated material will either be relocated within fish pond, or sited appropriately so as to not cause any negative environmental effects. Changes to depth will be based upon recommendations by conservation planner or other indidvidual with appropriate credentials. Resource Concerns addressed include: Inadequate Habitat for Fish and Wildlife - Habitat degradation. Practice installation may also address: Water Quality Degradation - Elevated water temperatures. Associated Practice (if required): Critical Area Planting - 342

**Before Situation:**

Existing fish pond lacks sufficent depth, diversity of depth or desired bottom structure to provide optimum habitat for desired fish species.

**After Situation:**

Depth and bottom structure of fishpond are appropriate for desired fish species. Resource concerns have been addressed. Participant will follow Operation and Maintenance guidance to ensure created habitat is maintained and continues to provide the benefits to the resources.

**Feature Measure:** Acre of pond managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,968.74

**Scenario Cost/Unit:** $3,968.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 200 | $770.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 10 | $294.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #34 - Infaunal Culture Yr-1

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control on 1 acre of bivalves, usually clams, that are seeded IN the substrate of the ocean floor and tended and grown for two to three years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of redundant gear, increased labor above normal operating procedures and recordkeeping for the first year of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 20 beds/acre; 900sf/bed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,155.20

**Scenario Cost/Unit:** $5,155.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 160 | $5,155.20 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #35 - Infaunal Culture Yrs 2-3

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control on 1 acre of bivalves, usually clams, that are seeded IN the substrate of the ocean floor and tended and grown for two to three years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of increased labor above normal operating procedures and recordkeeping for the second and third years of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 20 beds/acre; 900sf/bed

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,897.44

**Scenario Cost/Unit:** $4,897.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 152 | $4,897.44 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #36 - 50,000 Epifaunal Culture Yr-1

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control for raising 50,000 bivalves, usually oysters, ON or NEAR the substrate of the ocean floor, for three or more years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of redundant gear, increased labor above normal operating procedures and recordkeeping for the first year of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 50,000 bivalves

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,732.80

**Scenario Cost/Unit:** $7,732.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 240 | $7,732.80 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #37 - 50,000 Epifaunal Culture Yrs 2-3

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control for raising 50,000 bivalves, usually oysters, ON or NEAR the substrate of the ocean floor, for three or more years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of increased labor above normal operating procedures and recordkeeping for the second and third years of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 50,000 bivalves

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,732.80

**Scenario Cost/Unit:** $7,732.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 240 | $7,732.80 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #38 - 100,000 Epifaunal Culture Yr-1

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control for raising 100,000 bivalves, usually oysters, ON or NEAR the substrate of the ocean floor, for three or more years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of redundant gear, increased labor above normal operating procedures and recordkeeping for the first year of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 100,000 bivalves

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $15,465.60

**Scenario Cost/Unit:** $15,465.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 480 | $15,465.60 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #39 - 100,000 Epifaunal Culture Yrs 2-3

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control for raising 100,000 bivalves, usually oysters, ON or NEAR the substrate of the ocean floor, for three or more years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of increased labor above normal operating procedures and recordkeeping for the second and third years of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 100,000 bivalves

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $15,465.60

**Scenario Cost/Unit:** $15,465.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 480 | $15,465.60 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #40 - 500,000 Epifaunal Culture Yr-1

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control for raising 500,000 bivalves, usually oysters, ON or NEAR the substrate of the ocean floor, for three or more years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of redundant gear, increased labor above normal operating procedures and recordkeeping for the first year of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 500,000 bivalves

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $77,328.00

**Scenario Cost/Unit:** $77,328.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2400 | $77,328.00 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #41 - 500,000 Epifaunal Culture Yrs 2-3

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control for raising 500,000 bivalves, usually oysters, ON or NEAR the substrate of the ocean floor, for three or more years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of increased labor above normal operating procedures and recordkeeping for the second and third years of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 500,000 bivalves

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $77,328.00

**Scenario Cost/Unit:** $77,328.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2400 | $77,328.00 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #42 - 1 mil Epifaunal Culture Yr-1

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control for raising >= 1 million bivalves, usually oysters, ON or NEAR the substrate of the ocean floor, for three or more years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of redundant gear, increased labor above normal operating procedures and recordkeeping for the first year of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 1 million bivalves

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $154,656.00

**Scenario Cost/Unit:** $154,656.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4800 | $154,656.00 |

**Practice:** 400 - Bivalve Aquaculture Gear and Biofouling Control

**Scenario** #43 - Epifaunal Culture

**Scenario Description:**

This scenario describes the implementation of aquaculture gear and biofouling control for raising >=1 million bivalves, usually oysters, ON or NEAR the substrate of the ocean floor, for three or more years until they reach marketable size. The planned practice will meet the current 400 standard. Implementation will result in the proper rate, method and timing of gear and biofouling controls, including increased level of monitoring, frequency of cleaning, cycling/rotating and hauling gear, disposing of waste gear, and keeping records demonstrating implementation of the 400 criteria. Payment for implementation is to defray the costs of increased labor above normal operating procedures and recordkeeping for the second and third years of the growth cycle.

**Before Situation:**

Aquaculture gear (preditor exclusion apparatus) is overgrown with biofouling organisms; water flow and food supply is significantly reduced endagering shellfish health and growth. Increased drag increases risk of gear escaping into the marine environment; escaped gear presents entanglement hazards to marine wildlife. Organic loading and aquatic nuisance species release are potential negative impacts of in-water gear cleaning activities.

**After Situation:**

Producer uses environmentally sound methods to maintain adequate water flow to bivalves by monitoring, minimizing and removing biofouling organisms. Damaged or excessively fouled gear is removed from the water and transported on-shore for cleaning or disposal.

**Feature Measure:** 1 million bivalves

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $154,656.00

**Scenario Cost/Unit:** $154,656.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4800 | $154,656.00 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #1 - Check Dams

**Scenario Description:**

Typical setting is on a 40-acre pasture/hayland field having a slope of 5 to 10 percent where ephemeral gullies have formed. Typical installation consists of stabilizing/regrading the gully and installing six check dams with a top width of 3', average height of 2.5', 19' length, and 2:1 side slopes, ; containing an average of 21 tons of rock for a total of 126 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

**Before Situation:**

The operator presently has erosion gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed vegetation of disturbed areas use Critical Area Planting (342).

**Feature Measure:** Tons of rock installed

**Scenario Unit:** Ton

**Scenario Typical Size:** 126.00

**Scenario Total Cost:** $13,350.18

**Scenario Cost/Unit:** $105.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 160 | $260.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 84 | $12,328.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #2 - Embankment, Pipe <= 6 inch

**Scenario Description:**

An earthen embankment dam with a principal spillway pipe of 6 inches or less. Assessment shows anti-seep collars or sand diaphragms are not required. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,000 cubic yards, and 80 feet of pipe 6" PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $12,207.14

**Scenario Cost/Unit:** $6.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2000 | $8,420.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 20 | $128.20 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 5 | $625.55 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 20 | $1,023.20 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 5 | $249.05 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $11.70 | 80 | $936.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #3 - Embankment, Pipe 8-12 inch

**Scenario Description:**

An earthen embankment dam with a principle spillway pipe between 8 and 12 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $19,025.15

**Scenario Cost/Unit:** $7.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2500 | $10,525.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 29 | $185.89 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 10 | $1,251.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 30 | $1,534.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 30 | $966.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 10 | $498.10 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 3 | $91.08 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 60 | $135.00 |
| Pipe, PVC, 10 in., SCH 80 | 1351 | Materials: - 10 inch - PVC - SCH 80 - ASTM D1785 | Feet | $36.28 | 90 | $3,265.20 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #4 - Embankment, Pipe >12 inch

**Scenario Description:**

An earthen embankment dam with a principle spillway pipe greater than 12 inches. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, smooth steel drop inlet principle spillway with a 7 ft riser and 90 ft barrel, and 82 Square feet of anti-seep collars. A rock lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $24,872.32

**Scenario Cost/Unit:** $9.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 1 | $213.84 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2 | $1,080.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2500 | $10,525.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 129 | $826.89 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 13 | $1,626.43 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 38 | $1,944.08 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 42 | $1,353.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 13 | $647.53 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 14 | $2,054.78 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 30 | $71.70 |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $7.19 | 82 | $589.58 |
| Pipe, Steel, 12 in., Std Wt, USED | 1356 | Materials: - USED - 12 inch - Steel Std Wt | Feet | $32.37 | 90 | $2,913.30 |
| Pipe, Steel, 16 in., Std Wt, USED | 1357 | Materials: - USED - 16 inch - Steel Std Wt | Feet | $64.71 | 7 | $452.97 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #5 - Embankment, Soil Treatment

**Scenario Description:**

An earthen embankment dam with a principal spillway pipe where on site soils are not acceptable and require extra processing or hauling from off farm, distances greater than one mile. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10" pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Cubic Yards of Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $28,525.15

**Scenario Cost/Unit:** $11.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2500 | $10,525.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 29 | $185.89 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 10 | $1,251.10 |
| Hauling, bulk, highway truck | 1615 | Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck. | Cubic Yard Mile | $0.38 | 25000 | $9,500.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 30 | $1,534.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 30 | $966.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 10 | $498.10 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 3 | $91.08 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 60 | $135.00 |
| Pipe, PVC, 10 in., SCH 80 | 1351 | Materials: - 10 inch - PVC - SCH 80 - ASTM D1785 | Feet | $36.28 | 90 | $3,265.20 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #6 - Pipe Drop, Plastic

**Scenario Description:**

A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed using plastic pipe without anti-seep collars. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon 6 ft high 18" (1.5') PVC riser with a 40 ft long barrel (1.5' x 3.14 x 40' = 188 SF). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Riser Weir Length x Barrel Length

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 188.00

**Scenario Total Cost:** $9,565.05

**Scenario Cost/Unit:** $50.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1 | $540.30 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 100 | $421.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 20 | $128.20 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 2 | $250.22 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Pipe, PVC, 18 in., SCH 40 | 1373 | Materials: - 18 inch - PVC - SCH 40 - ASTM D1785 | Feet | $64.60 | 40 | $2,584.00 |
| Coupling, PVC, Tee, 24x18, SCH 40 | 1374 | Materials: - Tee, 24 x 18 inch - PVC - SCH 40 - ASTM D1785 | Each | $4,700.60 | 1 | $4,700.60 |
| Pipe, PVC, 24 in., ASTM-2241, SDR 26 | 1945 | Materials: - 24 inch - PVC - ASTM 2241, SDR 26 | Feet | $43.74 | 6 | $262.44 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #7 - Pipe Drop, Steel

**Scenario Description:**

A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed with a metal anti-seep collar. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel pipe drop structure with a 36", 12' tall riser and a 100' long 30" barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 30ft = 940). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Riser Weir Length x Barrel Length

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 940.00

**Scenario Total Cost:** $22,902.17

**Scenario Cost/Unit:** $24.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 600 | $2,526.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 100 | $641.00 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 4 | $500.44 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 11 | $562.76 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Materials** | | | | | | |
| Steel, Plate, 1/8 in. | 1047 | Flat Steel Plate, 1/8 inch thick, materials only. | Square Feet | $7.19 | 30 | $215.70 |
| Pipe, Steel, 30 in., Std Wt, USED | 1361 | Materials: - USED - 30 inch - Steel Std Wt | Feet | $151.63 | 100 | $15,163.00 |
| Pipe, Steel, 36 in., Std Wt, USED | 1362 | Materials: - USED - 36 inch - Steel Std Wt | Feet | $167.11 | 12 | $2,005.32 |
| Steel, Plate, 3/8 in. | 1375 | Flat steel plate, 3/8 inch thickness. Materials only. | Square Feet | $21.57 | 9 | $194.13 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #8 - Weir Drop Structures

**Scenario Description:**

A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft (90 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Feet of Weir length times Drop Hei

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 90.00

**Scenario Total Cost:** $13,417.61

**Scenario Cost/Unit:** $149.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 9 | $4,862.70 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 9 | $12.78 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 40 | $102.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 75 | $315.75 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 5 | $625.55 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 30 | $966.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 5 | $249.05 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 3 | $93.45 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 11 | $582.01 |
| Corrugated Steel, 12 Gauge, galvanized | 1376 | Corrugated Steel, 12 gauge, 3 inch by 1 inch corrugations, galvanized, meets ASTM A 929. Materials only. | Square Feet | $21.54 | 212 | $4,566.48 |
| Pipe, CMP, 12 in., 14 Gauge | 1377 | 12 inch - Corrugated Steel Pipe. Galvanized, uncoated, 14 Gauge. Materials only. | Feet | $13.15 | 2 | $26.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #9 - Rock Drop Structures

**Scenario Description:**

A Straight Drop structure constructed of rock riprap held in place by galvanized wire, such as, gabion baskets, fence panels, or "sausage" baskets. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a gabion wall structure with a drop of 3ft and weir length of 8ft (48 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Feet of Weir length times Drop Hei

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 48.00

**Scenario Total Cost:** $4,108.00

**Scenario Cost/Unit:** $85.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 23 | $32.66 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 7 | $17.92 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 40 | $168.40 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 5 | $625.55 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hours | $117.72 | 3 | $353.16 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 5 | $249.05 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |
| **Materials** | | | | | | |
| Gabion basket or mat | 1378 | Gabion baskets or mats installed and filled on grade, includes materials, transport, equipment, and labor, does not include geotextile fabric. | Cubic Yards | $185.86 | 7 | $1,301.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #10 - Log Drop Structures

**Scenario Description:**

A Straight Drop structure constructed using bioengineering principles. In this instance the drop structure is constructed of logs, rock riprap, and earthfill. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon an 8 foot weir length and 3 foot drop. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized using using an engineered structure utilizing natural materials (bioengineered). The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structrue for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,173.36

**Scenario Cost/Unit:** $6,173.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 11 | $15.62 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 10 | $25.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 40 | $168.40 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 12 | $1,501.32 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 4 | $26.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hours | $117.72 | 20 | $2,354.40 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.09 | 1 | $10.09 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 5 | $267.55 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #11 - SWC, Difficult site

**Scenario Description:**

An earthen embankment dam with a principle spillway pipe equal to or > 12 inches. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Site located at edge of field with 10-20' drop requiring high riser, tree removal and ropck riprap plungepool. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Unit cost estimate is based upon a typical amount of earthfill of 300-800 cubic yards, smooth steel drop inlet principle spillway with a 6-12' ft high riser by 12-18" diameter, with a 80- 120 ft of barrel, and 60-90 Square feet of anti-seep collars. Several trees need removed. A rock lined plunge pool protects the outlet channel, that is located down at the toe of a 10-20 high embankment. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

**Before Situation:**

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

**After Situation:**

Area is stabilized. Installed a 10' high riser by 15" dia steel pipe, 12" barrel extending 100' to a rocklined plungepool. Approximately 500 CY of fill. Installation required several trees to be removed. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $18,625.09

**Scenario Cost/Unit:** $18,625.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 1 | $213.84 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 450 | $1,894.50 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 50 | $320.50 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 2 | $250.22 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 500 | $1,925.00 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 1 | $53.78 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 20 | $2,935.40 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 5 | $155.75 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 72 | $172.08 |
| Pipe, Steel, 12 in., Std Wt, USED | 1356 | Materials: - USED - 12 inch - Steel Std Wt | Feet | $32.37 | 10 | $323.70 |
| Pipe, Steel, 20 in., Std Wt, USED | 1359 | Materials: - USED - 20 inch - Steel Std Wt | Feet | $64.18 | 100 | $6,418.00 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 412 - Grassed Waterway

**Scenario** #1 - Waterway, over 0.2 acres

**Scenario Description:**

Typical practice is 1244 ' long by 35' wide by 1.2' deep parabolic channel. The waterway is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Establishment of vegetation is included. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Associated Practices: Diversion (362), Critical Area Seeding (342), Mulching (484), Underground Outlet (620), Structure for Water Control (587), Subsurface Drainage (606), Water and Sediment Control Basin (638).

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1244' long by 35' wide by 1.2' deep parabolic earthen channel. The practice is installed using a dozer. Topsoil stripped and replaced. Included is seed bed preperation, seeding, lime, fertillizer etc. for establishment of vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,657.07

**Scenario Cost/Unit:** $5,657.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1612 | $1,466.92 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 1739 | $2,834.57 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.5 | $178.04 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.25 | $76.56 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.25 | $63.03 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 60 | $60.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 60 | $35.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 412 - Grassed Waterway

**Scenario** #2 - Waterway, small, 0.2 Acres or less

**Scenario Description:**

Typical practice is 200 ' long by 35' wide by 1.2' deep parabolic channel. The waterway is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Establishment of vegetation is included. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Associated Practices: Diversion (362), Critical Area Seeding (342), Mulching (484), Underground Outlet (620), Structure for Water Control (587), Subsurface Drainage (606), Water and Sediment Control Basin (638).

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 200' long by 35' wide by 1.2' deep parabolic earthen channel. The practice is installed using a dozer. Topsoil stripped and replaced. Included is seed bed preperation, seeding, lime, fertillizer etc . for establishment of vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Area of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 6,970.00

**Scenario Total Cost:** $1,226.83

**Scenario Cost/Unit:** $0.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.16 | $2.11 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.16 | $1.16 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.16 | $3.56 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 260 | $236.60 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 280 | $456.40 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.08 | $28.49 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.04 | $12.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.04 | $10.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 5 | $5.10 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 10 | $10.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 10 | $5.90 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 0.32 | $34.93 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 0.16 | $13.51 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 412 - Grassed Waterway

**Scenario** #3 - Grass Waterway with Stone Checks

**Scenario Description:**

Typical practice is 1244 ' long by 35' wide by 1.2' deep parabolic channel. A waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Instead of using Mulching to allow vegetative establishment, stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Stone Checks are installed 18" deep. Establishment of vegetation is included in non-check dam areas. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Associated Practices: Diversion (362), Critical Area Seeding (342), Mulching (484), Underground Outlet (620), Structure for Water Control (587), Subsurface Drainage (606), Water and Sediment Control Basin (638).

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1244' long by 35' wide by 1.2' deep parabolic earthen channel. Stone checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Stone checks are installed with small backhoe and labor. Include seed bed preperation, seeding, lime, fertillizer etc. to establish vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,471.59

**Scenario Cost/Unit:** $7,471.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 7 | $372.47 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1612 | $1,466.92 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 1739 | $2,834.57 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.5 | $178.04 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.25 | $76.56 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.25 | $63.03 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 11 | $354.42 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 36 | $1,121.40 |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 60 | $60.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 50 | $29.50 |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 181 | $381.91 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 412 - Grassed Waterway

**Scenario** #25 - Base Waterway

**Scenario Description:**

Typical practice is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,258.63

**Scenario Cost/Unit:** $2,258.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 800 | $1,304.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 60 | $60.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 60 | $35.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 412 - Grassed Waterway

**Scenario** #26 - With Checks

**Scenario Description:**

Typical practice is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18" deep with 12" laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

**After Situation:**

Installed grassed waterway is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** Acre of Waterway

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,383.01

**Scenario Cost/Unit:** $3,383.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 33 | $84.48 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 33 | $211.53 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 800 | $1,304.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 30 | $30.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 60 | $60.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 60 | $35.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 132 | $278.52 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #105 - Highly Specialized Monarch Mix/No Foregone Income

**Scenario Description:**

Establish permanent herbaceous vegetation consisting of mostly native forbs and legumes on cropland or non-cropland. The highly specialized forb and legume mix provides food sources for monarch caterpillars and nectar sources for adult monarchs. Typical mix composition is at least 2-3% native milkweeds, and 60% monarch nectaring plants by seed. Scenario includes light site prep about 2 weeks prior to planting to control quick colonizing annual weeds, but does not include site prep that requires multiple treatments to control existing vegetation, or where site preparation must occur in the year prior to planting. Scenario includes mowing to control weeds in first and second growing seasons. Practice is fully implemented when final weed control for establishment is complete. This practice scenario is used to provide monarch reproduction and nectaring habitat, and may also reduce soil erosion, reduce soil quality degradation, improve water quality, provide pollinator and wildlife habitat, and reduce air quality impacts. Supporting practices: Herbaceous Weed Treatment (315), Brush Management (314).

**Before Situation:**

The area to be established is mostly bare soil or contains some annual weeds.

**After Situation:**

Area is established to a meadow typically containing 2-3% native milkweeds and 60% monarch nectaring plants. The land is protected from erosion, and provides food and cover for wildlife and pollinators.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $2,857.22

**Scenario Cost/Unit:** $1,428.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 6 | $79.26 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 8 | $172.64 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability. | 2618 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a highly specialized mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed may have limited availability and be difficult to obtain, e.g. milkweed species. Restricted for use with Wildlife Habitat Planting (420) and Restoration of Rare or Declining Natural Communities (643). Includes materials and shipping. | Acres | $875.97 | 2 | $1,751.94 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 4 | $676.56 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #106 - Low Species Diversity/Light Site Prep/No Foregone Income

**Scenario Description:**

Establish permanent herbaceous vegetation consisting of introduced cool season grasses and clovers. Scenario includes light site prep about 2 weeks prior to planting to control quick colonizing annual weeds, but does not include site prep that requires multiple treatments to control existing vegetation, or where site preparation must occur in the year prior to planting. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Supporting practices Herbaceous Weed Treatment (315) and Brush Management (314).

**Before Situation:**

Areas not being used for crop production are mostly bare soil or contain some annual weeds.

**After Situation:**

Area is established to a dense stand of perennial cool season grasses and clovers, protecting land from erosion, providing water quality benefits, enhancing soil quality, and providing forage and cover for wildlife.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $3,266.97

**Scenario Cost/Unit:** $217.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 15 | $198.15 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 15 | $323.70 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 15 | $334.05 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 15 | $1,903.65 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 3 | $507.42 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #109 - High Species Diversity_Pollinator/Light Site Prep/No Foregone Income

**Scenario Description:**

Establish permanent herbaceous vegetation consisting of mostly native perennial forbs and legumes on non-cropland. The forb and legume component provide pollen and nectar sources, and typically comprise 75% or more of the mix by seed. Scenario includes light site prep about 2 weeks prior to planting to control quick colonizing annual weeds, but does not include site prep that requires multiple treatments to control existing vegetation, or where site preparation must occur in the year prior to planting. Scenario includes mowing to control weeds in first and second growing seasons. Practice is fully implemented when final weed control for establishment is complete. This practice scenario is used to provide habitat for bees, pollinators, and beneficial insects and may also reduce soil erosion, reduce soil quality degradation, improve water quality, provide pollinator and wildlife habitat, and reduce air quality impacts. Supporting practices: Herbaceous Weed Treatment (315), Brush Management (314). This scenario varies from the national scenario because extensive site preparation is not included.

**Before Situation:**

Areas not being used for crop production are bare or contain some annual weeds.

**After Situation:**

Area is established to a meadow of mostly perennial native forbs and legumes with or without native perennial grasses. The land is protected from erosion, and provides food and cover for wildlife, pollinators and beneficial insects.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $1,851.86

**Scenario Cost/Unit:** $925.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 4 | $86.32 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 2 | $885.74 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 4 | $676.56 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #110 - Moderate Species Diversity/Light Site Prep/No Foregone Income

**Scenario Description:**

Establish permanent herbaceous vegetation consisting of native grasses with or without forbs and legumes on non-cropland. Mix is typically 75% grasses or more by seed. Scenario includes light site prep about 2 weeks prior to planting to control quick colonizing annual weeds, but does not include site prep that requires multiple treatments to control existing vegetation, or where site preparation must occur in the year prior to planting. Practice is fully implemented when final weed control for establishment is complete. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Supporting practices: Herbaceous Weed Treatment (315), Brush Management (314).

**Before Situation:**

Areas not being used for crop production are mostly bare soil or contain some annual weeds.

**After Situation:**

Area is established to a mix of native perennial grasses with or without forbs, protecting land from erosion, providing water quality benefits, enhancing soil quality, and providing forage and cover for wildlife.

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $6,691.39

**Scenario Cost/Unit:** $446.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 15 | $198.15 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 60 | $1,294.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 15 | $334.05 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 15 | $4,055.55 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 4 | $676.56 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #216 - High Species Diversity on Cropland with Foregone Income

**Scenario Description:**

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a moderately diverse mix of seeds that is readily available for purchase from multiple vendors in combination with minor seed bed preparation. Seed is typically not available from traditional agricultural vendors and requires making a special order or ordering online. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

**Before Situation:**

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

**After Situation:**

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

**Feature Measure:** acres planted (per acre)

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $4,820.70

**Scenario Cost/Unit:** $964.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 5 | $66.05 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 5 | $30.25 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 5 | $111.35 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 5 | $1,780.35 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 5 | $83.40 |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 5 | $2,214.35 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #217 - Low Species Diversity on Cropland with Foregone Income

**Scenario Description:**

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a low diversity, low cost mix of readily available seeds in combination with minor seed bed preparation. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

**Before Situation:**

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

**After Situation:**

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

**Feature Measure:** acres planted (per acre)

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $3,407.17

**Scenario Cost/Unit:** $681.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 5 | $66.05 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 5 | $30.25 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 5 | $111.35 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 5 | $1,780.35 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 5 | $83.40 |
| Native Perennial Grasses, Legumes and/or Forbs, Low Density | 2753 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping. | Acres | $176.63 | 5 | $883.15 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #251 - Very Small Acreage (<.5 ac) Planting with Seedlings

**Scenario Description:**

This scenario is applicable to very small areas (typical size is ¼ acre) in need of wildlife habitat establishment by planting of potted plants, plugs, or similar non-seed plant materials. A wildlife habitat evaluation found the need to improve habitat by altering the current vegetative conditions (diversity, richness, structure or pattern). Potted herbaceous plants and/or shrubs are planted in 6' rows and a 4' spacing (1815 plants/acre) to facilitate access of the site with mechanical equipment (e.g., ATV, hand or riding mower) for weed control or other management after establishment. The site preparation requires treatment with broad spectrum herbicide to kill the existing vegetation. Then tillage, smoothing and firming of the soil is conducted prior to planting the plant materials.

**Before Situation:**

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and have the potential to meet or exceed the minimum criteria. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

**After Situation:**

The Wildlife Habitat Planting criteria have been successfully implemented. The site has been mechanically and chemically treated and planting has occurred. The area is adequately stocked with desired species and full coverage of permanent vegetation is expected. The vegetative cover will provide the desired habitat requirements for target wildlife. The site meets or exceeds planning criteria for inadequate wildlife habitat.

**Feature Measure:** sg ft planted (1/4 acre)

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 10,890.00

**Scenario Total Cost:** $6,409.88

**Scenario Cost/Unit:** $0.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.25 | $3.30 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 0.25 | $2.27 |
| Chemical, ground application, forested land | 1313 | Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs | Acres | $146.47 | 0.25 | $36.62 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 0.25 | $4.17 |
| Tree & Shrub, Specialty | 1523 | Locally-sourced, culturally significant, native, or other highly specialized trees and shrubs (e.g., American chestnut, American elm, Canada yew, Sagebrush). Potted or balled and burlapped tree or shrub, 5 gallon. Includes materials and shipping only. | Each | $12.50 | 454 | $5,675.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #254 - Specialized Habitat Requirements on Cropland with Foregone Income

**Scenario Description:**

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a specialized and often diverse mix of seeds that is NOT readily available for purchase, in combination with minor seed bed preparation. Seed is not available from traditional agricultural vendors and requires making a special order. Cost of seed is high due to limited availability and plant materials selected are needed to meet specific habitat requirements or ecosystem functions. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

**Before Situation:**

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

**After Situation:**

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

**Feature Measure:** acres planted (per acre)

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $6,903.87

**Scenario Cost/Unit:** $1,380.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 5 | $66.05 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 5 | $30.25 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 5 | $111.35 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 5 | $1,780.35 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 5 | $83.40 |
| Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability. | 2618 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a highly specialized mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed may have limited availability and be difficult to obtain, e.g. milkweed species. Restricted for use with Wildlife Habitat Planting (420) and Restoration of Rare or Declining Natural Communities (643). Includes materials and shipping. | Acres | $875.97 | 5 | $4,379.85 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 420 - Wildlife Habitat Planting

**Scenario** #266 - Interplanting with potted plants or shrubs

**Scenario Description:**

Herbaceous potted plants (e.g., milkweed) or shrubs are interplanted into existing herbaceous habitat to meet a missing life-need or habitat component. The typical scenario includes treatment of broad-spectrum herbicide prior to planting on a 4.5 X 50-foot area, followed by hand planting of 12 potted plants, plugs, or seedlings at 4-foot spacings. Noxious weeds are controlled during the 1st summer by spot treatment (hand removal or herbicide). An alternative arrangement for this scenario is a block planting of a 15 X 15 area, with three rows spaced 4 feet apart.

**Before Situation:**

The habitat is lacking a single life-need.

**After Situation:**

The habitat is providing all life needs of the identified wildlife species, considering the scale of the land unit.

**Feature Measure:** square feet treated and planted

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 225.00

**Scenario Total Cost:** $459.85

**Scenario Cost/Unit:** $2.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2 | $25.62 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 5 | $267.55 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Tree & Shrub, Specialty | 1523 | Locally-sourced, culturally significant, native, or other highly specialized trees and shrubs (e.g., American chestnut, American elm, Canada yew, Sagebrush). Potted or balled and burlapped tree or shrub, 5 gallon. Includes materials and shipping only. | Each | $12.50 | 12 | $150.00 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #1 - Shrubs with Interseeding, with Shelters

**Scenario Description:**

Linear planting of shrubs to break up a field and provide food, cover, interspersion, and connectivity for wildlife. Hedgerow is 500 feet in length, with two rows of seedlings planted on 8x8 foot spacing. Shrubs are protected from deer browse with 30-inch shelters. A grass/forb mix is seeded within the footprint of the hedgerow to provide wildlife food and cover. The footprint is 0.2 acres (2 rows x 8' spacing x 500' = 8,000 SF). Scenario address Inadequate Habitat for Wildlife, Undesirable Plant Productivity, Inadequate Plant Composition & Structure. Feature measure is length of hedgerow x number of rows: 500 feet x 2 rows = 1,000 feet.

**Before Situation:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries, mast, and pollinator resources are limited.

**After Situation:**

Habitat patches are connected by dense hedgerow vegetation. Trees and shrubs planted at 8 foot spacing and protected by shelters. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed. Native grasses and forbs provide cover and food until shrubs establish.

**Feature Measure:** Length of Hedgerow x Number of R

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $1,156.22

**Scenario Cost/Unit:** $1.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 0.6 | $12.08 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.2 | $4.45 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 4 | $51.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 125 | $163.75 |
| Tree shelter, solid tube type, 5 in. x 30 in. | 1570 | 5 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $3.01 | 125 | $376.25 |
| Stakes, wood, 1 in. x 1 in. x 36 in. | 1577 | 1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.01 | 125 | $126.25 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.2 | $25.38 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #2 - Contour Native

**Scenario Description:**

Typically installation of this scenario is within an annually cropped field. The hedge row is planted on the contour to provide a physical and visual aid to contour farming. This scenario is used to facilitate additional measures that address the resource concerns of; sheet and rill soil erosion and Water Quality Degradation, excess sediment in surface waters. Trees, shrubs, and grasses adapted for local climatic and edaphic conditions are typically planted at eight foot intervals (this will vary with species selection and density goals). Species selected should be at least three feet tall at maturity. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence. Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Contour farming practices are made difficult or less effective due to a lack of visual clues as to the location of the contours. Soil is lost to sheet and rill erosion. Sediments are deposited into surface waters.

**After Situation:**

Hedgerow planted on the contour presents a physical and visual guide for tillage and planting operations on the contour. Soil erosion from sheet and rill sources is reduced and the resultant deposition of sediment to surface waters is in turn reduced.

**Feature Measure:** Length of Hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 800.00

**Scenario Total Cost:** $1,067.89

**Scenario Cost/Unit:** $1.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 0.25 | $5.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.25 | $5.57 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2.5 | $32.03 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2.5 | $80.55 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 100 | $123.00 |
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 100 | $48.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallons | $49.01 | 0.25 | $12.25 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 6 | $761.46 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #3 - Contour Introduced

**Scenario Description:**

Typically installation of this scenario is within an annually cropped field. The hedge row is planted on the contour to provide a physical and visual aid to contour farming. This scenario is used to facilitate additional measures that address the resource concerns of; sheet and rill soil erosion and Water Quality Degradation, excess sediment in surface waters. Trees, shrubs, and exotic grasses adapted for local climatic and edaphic conditions are selected. Typically woody species are planted at eight foot intervals (this will vary with species selection and density goals). Species selected should be at least three feet tall at maturity. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence. Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Contour farming practices are made difficult or less effective due to a lack of visual clues as to the location of the contours. Soil is lost to sheet and rill erosion. Sediments are deposited into surface waters.

**After Situation:**

Hedgerow planted on the contour presents a physical and visual guide for tillage and planting operations on the contour. Soil erosion from sheet and rill sources is reduced and the resultant deposition of sediment to surface waters is in turn reduced.

**Feature Measure:** Length of Hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 800.00

**Scenario Total Cost:** $670.03

**Scenario Cost/Unit:** $0.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 0.25 | $5.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.25 | $5.57 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2.5 | $32.03 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2.5 | $80.55 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 100 | $123.00 |
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 100 | $48.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallons | $49.01 | 0.25 | $12.25 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 8 | $363.60 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #4 - Shrubs, No Shelters

**Scenario Description:**

Linear planting of shrubs to break up a field and provide food, cover, interspersion, and connectivity for wildlife. Hedgerow is 500 feet in length, with two rows of seedlings planted on 8x8 foot spacing. The footprint is 0.2 acres (2 rows x 8' spacing x 500' = 8,000 SF). Shrubs are not sheltered. Scenario address Inadequate Habitat for Wildlife, Undesirable Plant Productivity, Inadequate Plant Composition & Structure. Feature measure is length of hedgerow x number of rows: 500 feet x 2 rows = 1,000 feet.

**Before Situation:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries, mast, and pollinator resources are limited.

**After Situation:**

Habitat patches are connected by dense hedgerow vegetation. Trees and shrubs planted at 8 foot spacing. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

**Feature Measure:** Length of Hedgerow, per row of tre

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $315.46

**Scenario Cost/Unit:** $0.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2 | $25.62 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 125 | $163.75 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallons | $49.01 | 0.25 | $12.25 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #5 - Shrubs w/Interseeding, No Shelters

**Scenario Description:**

Linear planting of shrubs/trees to break up a field and provide food, cover, interspersion, and connectivity for wildlife. Hedgerow is 500 feet in length, with two rows of seedlings planted on 8x8 foot spacing. A grass/forb mix is seeded within the footprint of the hedgerow to provide wildlife food and cover. The footprint is 0.2 acres (2 rows x 8' spacing x 500' = 8,000 SF). Scenario address Inadequate Habitat for Wildlife, Undesirable Plant Productivity, Inadequate Plant Composition & Structure. Feature measure is length of hedgerow x number of rows: 500 feet x 2 rows = 1,000 feet.

**Before Situation:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries, mast, and pollinator resources are limited.

**After Situation:**

Habitat patches are connected by dense hedgerow vegetation. Trees and shrubs planted at 8 foot spacing. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed. Native grasses and forbs provide cover and food until shrubs establish.

**Feature Measure:** Length of Hedgerow x Number of R

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $526.52

**Scenario Cost/Unit:** $0.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 0.6 | $12.08 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.2 | $4.45 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2 | $25.62 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 125 | $163.75 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallons | $49.01 | 0.25 | $12.25 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.2 | $25.38 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #6 - Shrubs with Shelters

**Scenario Description:**

Linear planting of shrubs to break up a field and provide food, cover, interspersion, and connectivity for wildlife. Hedgerow is 500 feet in length, with two rows of seedlings planted on 8x8 foot spacing. Shrubs are protected from deer browse with 30-inch shelters. The footprint is 0.2 acres (2 rows x 8' spacing x 500' = 8,000 SF). Scenario address Inadequate Habitat for Wildlife, Undesirable Plant Productivity, Inadequate Plant Composition & Structure. Feature measure is length of hedgerow x number of rows: 500 feet x 2 rows = 1,000 feet.

**Before Situation:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries, mast, and pollinator resources are limited.

**After Situation:**

Habitat patches are connected by dense hedgerow vegetation. Trees and shrubs planted at 8 foot spacing and protected by shelters. Food resources in crop fields are made available by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

**Feature Measure:** Length of Hedgerow x Number of R

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $945.17

**Scenario Cost/Unit:** $0.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 4 | $51.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 125 | $163.75 |
| Tree shelter, solid tube type, 5 in. x 30 in. | 1570 | 5 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $3.01 | 125 | $376.25 |
| Stakes, wood, 1 in. x 1 in. x 36 in. | 1577 | 1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.01 | 125 | $126.25 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #7 - Poultry Trees

**Scenario Description:**

Two or more 660 foot rows (125% of length of poultry house) of hardwood and conifer trees for wind protection, energy conservation, air quality, or to provide a visual screen. Trees are hand planted 8 feet apart in the row with rows 10 feet apart.This practice is typically applied to crop, pasture lands or headquarters. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561). Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Agricultural field near poultry headquarters which has one or more poultry houses requiring protection from wind, odor mitigation, and visual screen.

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion or reduce energy losses. Odors and other materials are reduced via capture of material by hedgerow(s) from poultry houses. Two or more hedgerows are comprised of conifer or hardwood trees.

**Feature Measure:** Length of Hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $4,089.53

**Scenario Cost/Unit:** $3.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 40 | $512.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 82 | $383.76 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 82 | $524.80 |
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 164 | $78.72 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallons | $49.01 | 0.25 | $12.25 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #8 - Poultry Grasses

**Scenario Description:**

One row, 600 feet, of potted grass seedlings are planted in the swale between two parallel poultry houses which are are 600 feet in length. At the end of the house are typically 4 tunnel ventilation fans which are 5 feet in diameter. Two rows of potted grass seedlings are planted in front of the tunnel fans plus an additional 20 feet to each side. Total length of the two rows is 120 feet (each row is 60 feet times 2 rows equals 120 feet). This practice is typically applied to crop, pasture lands or headquarters. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561). Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Agricultural field near poultry headquarters which has one or more poultry houses requiring protection from wind, odor mitigation, and visual screen.

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion or reduce energy losses. Odors and other materials are reduced via capture of material by hedgerow(s) from poultry houses. Grasses are planted in the swales and in front of the tunnels.

**Feature Measure:** Length of hedgerows

**Scenario Unit:** Feet

**Scenario Typical Size:** 720.00

**Scenario Total Cost:** $3,746.01

**Scenario Cost/Unit:** $5.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 0.1 | $2.01 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 360 | $2,455.20 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #9 - Poultry Trees & Grasses

**Scenario Description:**

Two or more 660 foot rows (125% of length of poultry house) of hardwood, conifer trees and native grasses for wind protection, energy conservation, air quality, or to provide a visual screen. Trees are hand planted 8 feet apart in the row with rows 10 feet apart. Grasses are planted in front of the tunnel ventilation fans on 2 foot centers. This practice is typically applied to crop, pasture lands or headquarters. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations). Associated Practices: Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area Protection (561). Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Agricultural field near poultry headquarters which has one or more poultry houses requiring protection from wind, odor mitigation, and visual screen.

**After Situation:**

Wind velocity suitably reduced to reduce soil erosion or reduce energy losses. Odors and other materials are reduced via capture of material by hedgerow(s) from poultry houses. Two or more hedgerows are comprised of conifer or hardwood trees, and grasses in front of the tunnels.

**Feature Measure:** Length of hedgerows

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $4,426.53

**Scenario Cost/Unit:** $3.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 0.6 | $12.08 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 40 | $512.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 60 | $409.20 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 75 | $351.00 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 75 | $480.00 |
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 150 | $72.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallons | $49.01 | 0.25 | $12.25 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #22 - Beetle Bank

**Scenario Description:**

Typically applies to cropland. Beetle banks are linear plantings of dense stands of native bunch grassess, placed in the center of or at regular intervals throughout crop fields to provide substrate for predaceous and beneficial invertebrates (e.g. beetles, spiders) as a component of integrated pest management, provide overwintering habitat for certain pollinators, and provide habitat, including food, cover, and corridors for terrestrial wildlife. Typical beetle bank is a mounded berm 6ft wide and 750 feet long. Addresses resource concerns of Plant Pest Pressure, Plant Productivity and Health and Terrestrial Habitat for Wildlife and Invertebrates. Asociated practices include 595-Integrated Pest Managment, 420-Wildlife Habitat Planting, 340-Cover Crop or 327-Conservation Cover.

**Before Situation:**

Targeted area, such as a tilled crop field, lacks sufficient overall habitat conditions to support viable populations of predaceous insects, overwintering pollinators and other targeted species.

**After Situation:**

The installation of a beetle bank supports the habitat requirements of beetles, spiders, and other beneficial insects that attack crop pests in agricultural field, provides overwintering habitat for certain pollinators and supplies habitat and a travel corridor for target wildlife.

**Feature Measure:** Feet

**Scenario Unit:** Feet

**Scenario Typical Size:** 750.00

**Scenario Total Cost:** $1,956.11

**Scenario Cost/Unit:** $2.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 9 | $222.30 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 0.1 | $2.01 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 2 | $245.74 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.2 | $2.45 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 3 | $81.24 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 0.1 | $0.91 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 9 | $115.29 |
| **Foregone Income** | | | | | | |
| FI, Organic, Vegetables | 2252 | Vegetables is Primary Crop | Acres | $1,765.76 | 0.1 | $176.58 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 17 | $547.74 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 3 | $208.32 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #24 - Pollinator Habitat

**Scenario Description:**

In addition to the traditional hedgerow purposes where pollinator habitat is an additional wildlife habitat concern this scenario addresses the resource concern of inadequate fish and wildlife habitat. It provides both physical habitat by providing areas that are not disturbed by annual tillage and supplementle pollen and nector by establishing flowering Trees or shrubs. Typical installation is in or at the edge of cropland or pasture. Typical installation involves tillage to prepare the site for planting. Flowering trees and shrubs adapted for local climatic and edaphic conditions are typically planted at eight foot intervals (this will vary with species selection and density goals). A native grass adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. Species adapted to local climatic and edaphic conditions will be listed in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

**Before Situation:**

Pollen and nector sources are lacking or are only availble for part of the growing season. Large cropland tracks lack undisturbed areas for ground nesting bees

**After Situation:**

Flowering plants supply pollen and nector throughout the growing season. Undisturbed areas provide nesting sites for bees and other native pollinators.

**Feature Measure:** Length of Hedgerow

**Scenario Unit:** Feet

**Scenario Typical Size:** 800.00

**Scenario Total Cost:** $3,633.10

**Scenario Cost/Unit:** $4.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 0.25 | $5.03 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.25 | $5.57 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 100 | $3,222.00 |
| **Materials** | | | | | | |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 100 | $131.00 |
| Tree shelter, mesh tree tube, 24 in. | 1555 | 24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.48 | 100 | $48.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallons | $49.01 | 0.25 | $12.25 |
| Animal repellent, organic | 1908 | Organic compound animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallons | $42.63 | 1 | $42.63 |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2502 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $83.31 | 2 | $166.62 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #1 - PVC (Iron Pipe Size), 4 inches or less

**Scenario Description:**

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 4-inch. Construct 1/4 mile (1,320 feet) of 4-inch, SDR-26, PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of Pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $10,380.67

**Scenario Cost/Unit:** $7.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1320 | $2,019.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| **Materials** | | | | | | |
| Pipe, PVC, 4 in., SDR 26 | 989 | Materials: - 4 inch - PVC - SDR 26 160 psi - ASTM D2241 | Feet | $4.52 | 1452 | $6,563.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #2 - PVC (Iron Pipe Size) 10 inches or greater

**Scenario Description:**

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 12-inch, Class 125 (SDR-32.5), PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of pipeline

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $48,061.81

**Scenario Cost/Unit:** $36.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1320 | $4,290.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 13801 | $41,264.99 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #3 - PVC (Plastic Irrigation Pipe) 8 Inches

**Scenario Description:**

Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch, Construct 1/4 mile (1,320 feet) of 8-inch, 50 PSI (SDR-81.0), PVC PIP with appurtenances, installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of pipeline

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $10,497.60

**Scenario Cost/Unit:** $7.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1320 | $2,019.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 2150 | $6,428.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #4 - PVC (Plastic Irrigation Pipe) 10 inches or greater

**Scenario Description:**

Description: Below ground installation of PVC (Plastic Irrigation Pipe) pipeline. PVC (PIP) is manufactured in sizes (nominal diameter) from 4-inch to 27-inch; typical practice sizes range from 4-inch to 24-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 12-inch, Class 50 (SDR-81.0), PVC PIP with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is weight of pipe in pounds. 1,320 feet of 12-inch, Class 50 (SDR-81.0) PVC PIP weighs 3.594 lb/ft, or a total of 4,744 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 4,744.00

**Scenario Total Cost:** $22,456.84

**Scenario Cost/Unit:** $4.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1320 | $4,290.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 64 | $2,062.08 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 5218 | $15,601.82 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #5 - HDPE (Iron Pipe Size & Tubing) 6 inches

**Scenario Description:**

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 6-inch. Construct 1/4 mile (1,320 feet) of 6-inch, Class 100 (SDR-17) HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $24,969.44

**Scenario Cost/Unit:** $18.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1320 | $2,019.60 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 5 | $119.25 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 4851 | $21,489.93 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #6 - HDPE (Iron Pipe Size & Tubing) 10 inch

**Scenario Description:**

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 10 inch. Construct 1/4 mile (1,320 feet) of 10-inch, Class 100 (SDR-17), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Micro-irrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of pipeline.

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $63,225.75

**Scenario Cost/Unit:** $47.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1320 | $4,290.00 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 16 | $381.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 12755 | $56,504.65 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #26 - HDPE (Iron Pipe Size & Tubing) 3 inch or less

**Scenario Description:**

Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 3-inch. Construct 1/4 mile (1,320 feet) of 3-inch, 100 PSI (SIDR-15), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Micro-irrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of pipeline

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $9,320.26

**Scenario Cost/Unit:** $7.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1320 | $2,019.60 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 5 | $119.25 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 1333 | $5,905.19 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #27 - PVC (Plastic Irrigation Pipeline) 1 inch

**Scenario Description:**

Description: Below ground installation of 1 inch diameter PVC (Plastic Irrigation Pipe) pipeline. Construct 600 feet of 1-inch, SCH 40, PVC PIP with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The units are feet. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Length of pipe

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $2,880.62

**Scenario Cost/Unit:** $4.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 600 | $918.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| **Materials** | | | | | | |
| Pipe, PVC, 1 in., SCH 40 | 973 | Materials: - 1 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.04 | 660 | $686.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #28 - PVC (Plastic Irrigation Pipe) 2 inch

**Scenario Description:**

Description: Below ground installation of 2 inch diameter PVC (Plastic Irrigation Pipe) pipeline. Construct 600 feet of 2-inch, SCH 40 PVC PIP with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The units are feet. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $3,679.22

**Scenario Cost/Unit:** $6.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 600 | $918.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| **Materials** | | | | | | |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 660 | $1,485.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #29 - PVC (Plastic Irrigation Pipeline) 3 inch

**Scenario Description:**

Description: Below ground installation of 3 inch diameter PVC (Plastic Irrigation Pipe) pipeline. Construct 600 feet of 3-inch, SCH 40 PVC PIP with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The units are feet. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Length of pipe

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $5,276.42

**Scenario Cost/Unit:** $8.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 600 | $918.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| **Materials** | | | | | | |
| Pipe, PVC, 3 in., SCH 40 | 977 | Materials: - 3 inch - PVC - SCH 40 - ASTM D1785 | Feet | $4.67 | 660 | $3,082.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #31 - PVC (Iron Pipe Size) 6 inches to 8 inches

**Scenario Description:**

Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 8-inch, Schedule 40 PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is feet of pipe. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 20% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of Pipeline

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $34,226.77

**Scenario Cost/Unit:** $25.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1320 | $4,290.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SCH 40 | 981 | Materials: - 8 inch - PVC - SCH 40 - ASTM D1785 | Feet | $17.62 | 1584 | $27,910.08 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #35 - PVC (Iron Pipe Size) 8 Inches

**Scenario Description:**

Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from Â½-inch to 36-inch; typical practice sizes range from 2-inch to 24-inch. Construct 1/4 mile (1,320 feet) of 8-inch, Schedule 40 PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is feet of pipe. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 20% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of pipeline

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $33,453.49

**Scenario Cost/Unit:** $25.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1320 | $4,290.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SCH 40 | 981 | Materials: - 8 inch - PVC - SCH 40 - ASTM D1785 | Feet | $17.62 | 1584 | $27,910.08 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #36 - HDPE (Iron Pipe Size and Tubing) 8 Inches

**Scenario Description:**

"Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from Â½-inch to 24-inch; typical scenario size is 8-inch. Construct 1/4 mile (1,320 feet) of 8-inch, Class 130 (SDR-13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer. "

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of Irrigation Pipeline

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $40,554.22

**Scenario Cost/Unit:** $30.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1320 | $2,019.60 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 5 | $119.25 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 8209 | $36,365.87 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #39 - HDPE (Iron Pipe Size & Tubing) 4 Inches

**Scenario Description:**

"Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from Â½-inch to 24-inch; and typical scenario size is 4-inch. Construct 1/4 mile (1,320 feet) of 4-inch, 100 PSI (SDR-17), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is linear feet of pipe. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Length of Pipeline

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $14,107.12

**Scenario Cost/Unit:** $10.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1320 | $2,019.60 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 5 | $119.25 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 2239 | $9,918.77 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #40 - HDPE (Iron Pipe Size & Tubing) 12 Inches

**Scenario Description:**

Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from Â½-inch to 24-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 12-inch, 100 PSI (SDR-17.1), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Feet of pipeline.

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $84,693.04

**Scenario Cost/Unit:** $64.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1320 | $4,290.00 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 16 | $381.60 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 17950 | $79,518.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #53 - Boring, Pipeline All Sizes

**Scenario Description:**

Pipeline is bored under road or stream using seamless pipe that meets or exceeds main pipeline size and pressure rating. Site location does not allow for open trench. (I.e.,No permit can be obtained for open trench on road crossing and/or digging open trench across stream) Bore 100 feet of irrigation Pipeline. Appurtenances include: couplings and fittings to connect to planned pipeline and are included in the cost of pipe material (additional 10% of pipe material quantity). The scenario unit is linear feet of bored pipe from coupler to coupler. Revegetation is not included. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by irrigation system.

**After Situation:**

Pipeline(s) convey and/or distribute water to irrigation system.

**Feature Measure:** Ln Ft

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $15,183.86

**Scenario Cost/Unit:** $151.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Horizontal Boring, Greater Than 3 in. diameter | 1132 | Includes equipment, labor and setup. | Feet | $126.18 | 100 | $12,618.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 26 | 990 | Materials: - 6 inch - PVC - SDR 26 160 psi - ASTM D2241 | Feet | $9.81 | 100 | $981.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #71 - PVC (Iron Pipe Size), less than or equal to 4 inch, Small Scale System

**Scenario Description:**

Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36- inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 3-inch. Construct 260 feet of 3-inch, Class 125 (SDR-32.5), PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is weight of pipe material in pounds. 260 feet of 3-inch, Class 125 (SDR-32.5) PVC pipe weighs 0.730 lb/ft, or a total of 189.8 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation and Drainage Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Length of Pipe

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 260.00

**Scenario Total Cost:** $1,718.31

**Scenario Cost/Unit:** $6.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 260 | $397.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 208.78 | $624.25 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #84 - HDPE (Iron Pipe Size and Tubing), less than or equal to 2 inch, Small Scale

**Scenario Description:**

Below ground installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb/ft, or a total of 42 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 42.00

**Scenario Total Cost:** $1,810.84

**Scenario Cost/Unit:** $43.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 260 | $397.80 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 8 | $190.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 46 | $203.78 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #85 - Surface HDPE (Iron Pipe Size and Tubing), less than or equal to 2 inch, Small Scale

**Scenario Description:**

On-ground surface installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb/ft, or a total of 42 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 42.00

**Scenario Total Cost:** $402.10

**Scenario Cost/Unit:** $9.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 46 | $203.78 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #1 - Embankment Dam

**Scenario Description:**

The reservoir, created by an embankment built across a natural depression, with an 18" diameter principal spillway outlet through the embankment, is controlled by a canal-style gate. Outlet can also serve as overflow protection with a 12" diameter standpipe and tee to the 18" pipe. Any watershed runoff will be diverted around reservoir. It will be built with approximately 4,500 cubic yards of on-site material. It will be about 19.9 feet high and 200 feet long and hold approximately 1,000,000 gallons (3 acre-feet). The top of berm will be 10 feet wide and the embankment side slopes will be 2.5 H to 1 V up and down stream. Resource concern: Insufficient Water - Inefficient use of irrigation water. Associated practices include: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 378 - Pond; 447 - Irrigation System, Tailwater Recovery; 484 - Mulching; and 342 - Critical Area Planting.

**Before Situation:**

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application. Divert water around - no spillway

**After Situation:**

This is an embankment, installed across a natural off-stream intermittent watercourse, used to store water for subsequent irrigation. It will be used to accumulate and store water for timely and efficient application of water through an irrigation system The water source could be a well, irrigation district pipeline, and/or a pump from a stream. It is designed to deliver water by gravity to an open ditch or non-pressurized pipeline, generally in excess of 5 cfs. All earthen materials will be from on-site sources.

**Feature Measure:** Volume of Compacted Eartfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $25,919.49

**Scenario Cost/Unit:** $5.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 4500 | $18,945.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 12 in. | 1244 | Pipe, Corrugated HDPE Double Wall, 12 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $10.28 | 36 | $370.08 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 18 in. | 1245 | Pipe, Corrugated HDPE Double Wall, 18 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $18.65 | 120 | $2,238.00 |
| Screw gate, cast iron, 18 in. diameter, 10/0 head | 1917 | 18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only. | Each | $1,428.93 | 1 | $1,428.93 |
| Coupling, HDPE CPT Dual Wall, Tee, 18 in. x 18 in. x 12 in. | 1921 | Tee, 18 inch x 18 inch x 12 inch - HDPE CPT Tee. Materials only. | Each | $530.68 | 1 | $530.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #2 - Embankment Reservoir 30 or less Acre-Feet

**Scenario Description:**

This is a small rectangular embankment reservoir with a 10" diameter principal spillway through the embankment controlled by a canal-type gate. It is designed to accumulate, store, and deliver water by gravity to an open ditch or non-pressurized pipeline, in excess of 5 cfs. It will have an inside dimension of about 375 feet square, with 12 feet of fill and about 1600 feet total length of embankment (along the centerline). The embankment top will be 10 feet wide and the side slopes will no steeper than 2.5 H to 1 V inside and out. It will be built with approximately 28,500 cubic yards of on-site material. It will have a maximum water depth of 10 feet with 2 feet of freeboard and no auxiliary spillway. Volume is approximately 30 ac-ft (10,000,000 gallons). Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

**Before Situation:**

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

**After Situation:**

The square reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream, an irrigation well, or an irrigation district canal.

**Feature Measure:** Volume of Compacted Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 28,500.00

**Scenario Total Cost:** $126,018.58

**Scenario Cost/Unit:** $4.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 28500 | $119,985.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 10 in. | 1243 | Pipe, Corrugated HDPE Double Wall, 10 inch diameter with soil tight joints - AASHTO M252. Material cost only. | Feet | $7.28 | 100 | $728.00 |
| Screw gate, cast iron, 10 in. diameter, 10/0 head | 1916 | 10 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only. | Each | $988.98 | 1 | $988.98 |
| Catwalk, metal | 1918 | Metal pedestrian walk way giving access to the valve on a structure, typically 3 ft. wide with railing. Materials only. | Feet | $95.49 | 20 | $1,909.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #3 - Embankment Reservoir > 30 Acre-Feet

**Scenario Description:**

This is a very large embankment reservoir with a 18" diameter drain pipe through the embankment controlled by a canal-type gate. It is designed to accumulate, store, and deliver water by gravity to an open ditch or non-pressurized pipeline, in excess of 5 cfs. It will have a top width of 12ft and centerline length of embankment of 5,280 feet. Average fill of 10 feet and the side slopes will be no steeper than 3 H to 1 V inside and out. It will be built with approximately 105,000 cubic yards of on-site material. It will have a maximum water depth of 8 feet with 2 feet of freeboard and no auxiliary spillway. Volume is approximately 320 ac-ft (104,500,000 gallons). Critical Area Planting and Mulching is required. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

**Before Situation:**

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

**After Situation:**

The rectangular reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream or an irrigation district canal.

**Feature Measure:** Volume of Compacted Earthfill

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 104,200.00

**Scenario Total Cost:** $466,295.97

**Scenario Cost/Unit:** $4.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 104200 | $438,682.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Pipe, Steel, 18 in., Std Wt | 1366 | Materials: - 18 inch - Steel Std Wt | Feet | $183.47 | 100 | $18,347.00 |
| Screw gate, cast iron, 18 in. diameter, 10/0 head | 1917 | 18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only. | Each | $1,428.93 | 1 | $1,428.93 |
| Catwalk, metal | 1918 | Metal pedestrian walk way giving access to the valve on a structure, typically 3 ft. wide with railing. Materials only. | Feet | $95.49 | 50 | $4,774.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #4 - Excavated Tailwater Pit

**Scenario Description:**

This is an excavated pit with a control structure. It is designed to accumulate, store, deliver or regulate water for a surface irrigation system. It will have a bottom width of 20 ft and length of 1,250 feet. The side slopes will be no steeper than 1.5 H to 1 V inside and out. It will be built with approximately 20,000 cubic yards of on-site material. It will have a maximum water depth of 10 feet with 1 feet of freeboard. Volume is approximately 12 ac-ft (3,950,303 gallons). Resource concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

**Before Situation:**

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

**After Situation:**

An excavated regulating reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream or an irrigation district canal.

**Feature Measure:** Volume of Earth Excavated

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 19,600.00

**Scenario Total Cost:** $51,387.73

**Scenario Cost/Unit:** $2.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 19600 | $50,176.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #5 - Steel Tank

**Scenario Description:**

A 20,000 Gallon, above ground, enclosed fabricated Steel or bottomless Corrugated Metal (with plastic liner and cover) tank with fittings, is installed on 6" of well compacted drain rock support pad with sand padding (CM tank), to store water from a reliable source for irrigation of an area less than 5 acres. The scenario assumes the typical dimensions of the tank are 24 feet in diameter and 6 feet tall. The scenario also assumes a 28 feet diameter gravel base pad to extend a minimum of 2 feet past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include the cost for pumps, pipe, or fittings for the pipeline. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

**Before Situation:**

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

**After Situation:**

An above ground, enclosed fabricated steel or bottomless corrugated metal tank (with plastic liner and cover), capable of withstanding the elements, is used to accumulate and store water between irrigation cycles for a small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a very large roof area, a water ram , or a pump drawing water from a stream.

**Feature Measure:** Volume of Tank Storage

**Scenario Unit:** Gallons

**Scenario Typical Size:** 20,000.00

**Scenario Total Cost:** $23,298.32

**Scenario Cost/Unit:** $1.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 10 | $578.50 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hours | $15.45 | 16 | $247.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 8 | $242.88 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 12 | $298.56 |
| Tank, Corrugated Metal Storage, 20,000 gallon | 1920 | 20,000 gallon capacity enclosed corrugated Metal Storage tank. Includes delivery to the site and anchoring material. | Each | $15,774.40 | 1 | $15,774.40 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #6 - Plastic Tank

**Scenario Description:**

A 3,000 Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

**Before Situation:**

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

**After Situation:**

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram , or a pump drawing water from a stream.

**Feature Measure:** Volume of Tank Storage

**Scenario Unit:** Gallons

**Scenario Typical Size:** 3,000.00

**Scenario Total Cost:** $6,886.54

**Scenario Cost/Unit:** $2.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 6 | $347.10 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hours | $15.45 | 4 | $61.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.20 | 3000 | $3,600.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 2 | $49.76 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #7 - Fiberglass Tank

**Scenario Description:**

A 10,000 Gallon above ground, enclosed, fiberglass tank, is installed on 6" of well compacted drain rock support pad. The tank is used to store water from a reliable source for irrigation of areas less than 3 acres. The scenario assumes the typical dimensions of the tank are 15 feet in diameter and 8 feet tall. The scenario also assumes a 19 feet diameter gravel base pad to extend a minimum of 2 feet past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, fittings for the pipeline, or catchment area. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

**Before Situation:**

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

**After Situation:**

A large fiberglass enclosed tank, capable of withstanding the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application and better efficiency. Sources of water could be a well, a domestic water system, a very large roof area, a water ram , or a pump drawing water from a stream.

**Feature Measure:** Volume of Tank Storage

**Scenario Unit:** Gallons

**Scenario Typical Size:** 10,000.00

**Scenario Total Cost:** $18,593.72

**Scenario Cost/Unit:** $1.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hours | $15.45 | 4 | $61.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 6 | $149.28 |
| Tank, Fiberglass Enclosed Storage, 10,000 gallon | 1919 | 10,000 gallon capacity enclosed fiberglass water storage tank. Includes tank anchoring materials and delivery. | Each | $14,306.50 | 1 | $14,306.50 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #26 - Small Semi-Excavated Reservoir

**Scenario Description:**

A 200' x 200' x 8' semi-excavated reservoir is built in nearly flat land using a 1.17 CUT/FILL ratio. The calculated CUT and FILL volumes are 3,935 and 3,360 cu.yd. respectively. The top bank will be 12 feet wide and the embankment side slopes will be 2 H to 1 V inside and 3 H to 1 V outside. Excavated earthen material will be used to build the perimeter embankment (average push distance of 50 ft). The capacity of the reservoir is 2.03Mgal adequate to irrigate 1" over 75 acres during a week. Resource concern: Insufficient Water, Water Quality - Inefficient use of irrigation water. Associated Practices: 521 - Pond Sealing or Lining (various); 430 - Irrigation Pipeline; 533 - Pumping Plant; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler System; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

**Before Situation:**

Current system relies on a low-flow rate deep well or other water source that has insufficient flowrate for irrigation need.

**After Situation:**

This is a semi-excavated reservoir used to store water for subsequent irrigation. It will be used to accumulate and store water for timely and efficient application of water through an irrigation system.

**Feature Measure:** CUT Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,935.00

**Scenario Total Cost:** $23,067.39

**Scenario Cost/Unit:** $5.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 3360 | $14,145.60 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1157 | $1,052.87 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 3935 | $6,414.05 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 436 - Irrigation Reservoir

**Scenario** #37 - Plastic tank, less than or equal to 1,000 gallons

**Scenario Description:**

A 1,000 Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 72" in diameter and 66" tall. The scenario also assumes a 96" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

**Before Situation:**

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

**After Situation:**

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram , or a pump drawing water from a stream.

**Feature Measure:** Volume of Tank Storage

**Scenario Unit:** Gallons

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $4,305.17

**Scenario Cost/Unit:** $4.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 1 | $89.72 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 6 | $347.10 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hours | $15.45 | 1 | $15.45 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.50 | 1000 | $1,500.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 1 | $24.88 |
| Cable, Galvanized steel | 2182 | Galvanized steel aircraft cable in 7 x 19 strand core. Materials and shipping only. | Feet | $0.62 | 40 | $24.80 |
| Anchor, earthen, low disturbance, large | 2184 | Low disturbance, galvanized or aluminum alloy earthen anchors with holding power greather than 3,000 pounds in normal soil. Materials and shipping only. | Each | $51.19 | 4 | $204.76 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #1 - SDI (Subsurface Drip Irrigation)

**Scenario Description:**

A subsurface drip irrigation system (SDI) with a lateral spacing between 37- 60 inches. This buried drip irrigation system utilizes a thinwall dripperline or tape with inline emitters at a uniform spacing for the system laterals. The dripperline or tape is normally installed by being plowed in approx 10-14 inches deep with a chisel shank type plow equipped with tape reels. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried flush manifold with manual flush valves. This permanent micro-irrigation system includes an automated filter station, flow meter, backflow prevention device, automated control box or timer, the thinwall dipperline or tape for laterals, both a supply and a flushing manifold and numerous types of water control valves. This is an all-inclusive system starting with the filter station including all required system components out to the flush valves. The water supply line from the water source to the filter station is an irrigation pipeline (430) and is not included as part of this system  Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.  Associated Practices:  533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

Typical before irrigation situation would normally be an existing inefficient surface or sprinkler irrigation system on a cropland or hayland field. The existing irrigation system would experience poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality

**After Situation:**

A typical practice would be the installation of a subsurface drip irrigation system (SDI) on a 10 acre cropland or hayland field. The system lateral (thinwall dripperline or tape) spacing would 60 inches. This highly efficient SDI (buried) irrigation system  provides irrigation water directly to the plant root zone eliminating application losses resulting in a very high water application efficiency and properly designed these SDI systems are capable of very uniform water applications. Typical field size is 10 acres.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $37,437.64

**Scenario Cost/Unit:** $3,743.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1800 | $2,754.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training.  Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch.  Materials only. | Pound | $2.99 | 984 | $2,942.16 |
| Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush | 1482 | Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station. | Each | $6,650.72 | 2 | $13,301.44 |
| Micro Irrigation, screen filter, => 100 gpm | 1484 | Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller.?? Unit is complete and installed. Unit price per filter, not per filter station. | Each | $1,048.87 | 1 | $1,048.87 |
| Micro Irrigation, control valves and timers | 1485 | Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves.  Based on control unit, not number of valves controlled. | Each | $427.50 | 1 | $427.50 |
| Micro Irrigation, buried drip tape | 2521 | Tape that is installed underground for sub-surface drip irrigation, includes installation, and connections to the supply and flushing laterals.?? Tape is a minimum of 10 mil thick thick and has emitters built in.  Includes labor and installtion. | Feet | $0.13 | 95832 | $12,458.16 |
| Water Meter, Microirrigation,  >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer.  Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #2 - Surface PE Perennial Crops, filtered, no flow meter

**Scenario Description:**

A micro-irrigation system, utilizing surface tubing (can be placed on trellis or above ground) with emitters to provide irrigation for an orchard, vineyard, field nusery stock or other specialty crop grown in a grid pattern. The typical system is a permanent system, installed over 20 acres of perennial crops on the ground surface or trellis. This system utilizes emitters at each tree or plant as the water application device. Durable, UV resistant tube/tape is used for a multi-year system. This system typically includes all fittings, control valves, pressure reducing/regulating valves, air vacuum release, a filter system (screen/disc), pressure gauges, submains, lateral lines, and emitters to deliver water to plants at or below the soil infiltration rate on a typical 20 acre site. Does not include Pump, Power source, Water source (well or reservoir). The water supply line from the water source to the field edge is an irrigation pipeline (430) and is not included as part of this system. Water supply is not filtered. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

An orchard has an inefficient sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $64,410.74

**Scenario Cost/Unit:** $3,220.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 2700 | $4,131.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 2520 | $7,534.80 |
| Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush | 1482 | Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station. | Each | $6,650.72 | 2 | $13,301.44 |
| Micro Irrigation, screen filter, => 100 gpm | 1484 | Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller.?? Unit is complete and installed. Unit price per filter, not per filter station. | Each | $1,048.87 | 1 | $1,048.87 |
| Micro Irrigation, surface drip tubing | 1488 | Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in. | Feet | $0.34 | 106480 | $36,203.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #3 - Surface PE Perennial Crops

**Scenario Description:**

A micro-irrigation system, utilizing surface PE tubing (can be placed on trellis or above ground) with emitters to provide irrigation for an orchard, vineyard, field nusery stock or other specialty crop grown in a grid pattern. The typical system is a permanent system, installed over 20 acres of perennial crops on the ground surface or trellis. This system utilizes emitters at each tree or plant as the water application device. Durable, UV resistant tube/tape is used for a multi-year system. This system typically includes all fittings, control valves, pressure reducing/regulating valves, air vacuum release, a filter system (screen/disc), pressure gauges, submains, lateral lines, computerized soil moisture sensors system, and emitters to deliver water to plants at or below the soil infiltration rate on a typical 20 acre site. Does not include Pump, Power source, Water source (well or reservoir). The water supply line from the water source to the zone valves is an irrigation pipeline (430) and is not included as part of this system. Water supply is not filtered. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

An orchard has an inefficient sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $53,423.38

**Scenario Cost/Unit:** $2,671.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 2700 | $4,131.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 2520 | $7,534.80 |
| Micro Irrigation, screen filter, => 100 gpm | 1484 | Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller.?? Unit is complete and installed. Unit price per filter, not per filter station. | Each | $1,048.87 | 1 | $1,048.87 |
| Micro Irrigation, surface drip tubing | 1488 | Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in. | Feet | $0.34 | 106480 | $36,203.20 |
| Water Meter, Microirrigation, >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #4 - Surface PE Container Nursery

**Scenario Description:**

A micro-irrigation system, utilizing surface PE tubing (can be placed on trellis or above containers) with emitters to provide irrigation for container-grown nursery stock in a grid pattern. The typical system is a permanent system, installed over 10 acres of container-grown nursery stock with a 5 ft lateral spacing. This system utilizes emitters at each tree or plant as the water application device. Durable, UV resistant tube/tape is used for a multi-year system. This system typically includes all fittings, control valves, pressure reducing/regulating valves, air vacuum release, a filter system (screen/disc), pressure gauges, submains, lateral lines, computerized soil moisture sensors system, and emitters to deliver water to plants at or below the soil infiltration rate on a typical 10 acre site. Does not include Pump, Power source, Water source (well or reservoir). The water supply line from the water source to the zone valves is an irrigation pipeline (430) and is not included as part of this system. Water supply is not filtered. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

A container-grown nursery stock has an inefficient sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a ontainer-grown nursery stock. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $121,298.80

**Scenario Cost/Unit:** $12,129.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1800 | $2,754.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 788 | $2,356.12 |
| Micro Irrigation, screen filter, => 100 gpm | 1484 | Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller.?? Unit is complete and installed. Unit price per filter, not per filter station. | Each | $1,048.87 | 1 | $1,048.87 |
| Micro Irrigation, control valves and timers | 1485 | Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled. | Each | $427.50 | 1 | $427.50 |
| Micro Irrigation, emitters or sprays and tubing | 1489 | Emitters or sprays that are installed above ground for micro or drip irrigation. Includes installation and connections to the supply and flushing laterals. Tubing for the emitters is included in this item. | Feet | $1.15 | 95832 | $110,206.80 |
| Water Meter, Microirrigation, >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #5 - Surface PE Perennial Filtered

**Scenario Description:**

A micro-irrigation system, utilizing surface PE tubing (can be placed on trellis or above ground) with emitters to provide irrigation for an orchard, vineyard, field nusery stock or other specialty crop grown in a grid pattern. The typical system is a permanent system, installed over 20 acres of perennial crops on the ground surface or trellis. This system utilizes emitters at each tree or plant as the water application device. Durable, UV resistant tube/tape is used for a multi-year system. This system typically includes all fittings, control valves, pressure reducing/regulating valves, air vacuum release, a filter system (screen/disc), pressure gauges, submains, lateral lines, computerized soil moisture sensors system, and emitters to deliver water to plants at or below the soil infiltration rate on a typical 20 acre site. Does not include Pump, Power source, Water source (well or reservoir). An additional automatic-cleaning sand media filtration system or its equivalent is needed to prevent the passage of solids in sizes or quatities from the water source that might obstruct the emitter openings to ensure proper efficiency and uniformity of irrigation system. The water supply line from the water source to the zone valves is an irrigation pipeline (430) and is not included as part of this system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

An orchard has an inefficient sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $73,375.54

**Scenario Cost/Unit:** $3,668.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 2700 | $4,131.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 2520 | $7,534.80 |
| Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush | 1482 | Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station. | Each | $6,650.72 | 3 | $19,952.16 |
| Micro Irrigation, screen filter, => 100 gpm | 1484 | Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller.?? Unit is complete and installed. Unit price per filter, not per filter station. | Each | $1,048.87 | 1 | $1,048.87 |
| Micro Irrigation, surface drip tubing | 1488 | Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in. | Feet | $0.34 | 106480 | $36,203.20 |
| Water Meter, Microirrigation, >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #6 - Surface Tape Annual Filtered, no Flow Meter

**Scenario Description:**

A micro-irrigation system, utilizing surface drip tape to provide irrigation for vegetables. The typical system is a permanent system, installed over 10 acres of vegetables crops on the ground surface, with buried main lines and headers. This system utilizes closely spaced emitters as the water application device. This system typically includes all fittings, control valves, pressure reducing/regulating valves, air vacuum release, a filter system (screen/disc), pressure gauges, submains, to deliver water to plants at or below the soil infiltration rate on a typical 10 acre site. Does not include Pump, Power source, Water source (well or reservoir) and lateral lines (drip tape). An additional automatic-cleaning sand media filtration system or its equivalent is needed to prevent the passage of solids in sizes or quatities from the water source that might obstruct the emitter openings to ensure proper efficiency and uniformity of irrigation system. The water supply line from the water source to the field edge is an irrigation pipeline (430) and is not included as part of this system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

A vegetable field has an inefficient sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a vegetable field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $18,177.08

**Scenario Cost/Unit:** $1,817.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1100 | $1,683.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 303 | $905.97 |
| Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush | 1482 | Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station. | Each | $6,650.72 | 2 | $13,301.44 |
| Micro Irrigation, screen filter, < 100 gpm | 1617 | Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed. | Each | $95.24 | 1 | $95.24 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #7 - Surface Tape Annual Crops

**Scenario Description:**

A micro-irrigation system, utilizing surface drip tape to provide irrigation for vegetables. The typical system is a permanent system, installed over 10 acres of vegetables crops on the ground surface. This system utilizes closely spaced emitters as the water application device. This system typically includes all fittings, control valves, pressure reducing/regulating valves, air vacuum release, a filter system (screen/disc), pressure gauges, submains, computerized soil moisture sensors system, to deliver water to plants at or below the soil infiltration rate on a typical 10 acre site. Does not include Pump, Power source, Water source (well or reservoir) and lateral lines (drip tape). The water supply line from the water source to the zone valves is an irrigation pipeline (430) and is not included as part of this system. Water supply is not filtered. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

A vegetable field has an inefficient sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a vegetable field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $7,189.72

**Scenario Cost/Unit:** $718.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1100 | $1,683.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 303 | $905.97 |
| Micro Irrigation, screen filter, < 100 gpm | 1617 | Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed. | Each | $95.24 | 1 | $95.24 |
| Water Meter, Microirrigation, >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #8 - Surface Tape Annual Filtered

**Scenario Description:**

A micro-irrigation system, utilizing surface drip tape to provide irrigation for vegetables. The typical system is a permanent system, installed over 10 acres of vegetables crops on the ground surface. This system utilizes closely spaced emitters as the water application device. This system typically includes all fittings, control valves, pressure reducing/regulating valves, air vacuum release, a filter system (screen/disc), pressure gauges, submains, computerized soil moisture sensors system, to deliver water to plants at or below the soil infiltration rate on a typical 10 acre site. Does not include Pump, Power source, Water source (well or reservoir) and lateral lines (drip tape). An additional automatic-cleaning sand media filtration system or its equivalent is needed to prevent the passage of solids in sizes or quatities from the water source that might obstruct the emitter openings to ensure proper efficiency and uniformity of irrigation system. The water supply line from the water source to the zone valves is an irrigation pipeline (430) and is not included as part of this system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

A vegetable field has an inefficient sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a vegetable field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $20,491.16

**Scenario Cost/Unit:** $2,049.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1100 | $1,683.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 303 | $905.97 |
| Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush | 1482 | Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station. | Each | $6,650.72 | 2 | $13,301.44 |
| Micro Irrigation, screen filter, < 100 gpm | 1617 | Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed. | Each | $95.24 | 1 | $95.24 |
| Water Meter, Microirrigation, >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #9 - Surface PE Container Filtered

**Scenario Description:**

A micro-irrigation system, utilizing surface PE tubing (can be placed on trellis or above containers) with emitters to provide irrigation for container-grown nursery stock in a grid pattern. The typical system is a permanent system, installed over 10 acres of container-grown nursery stock. Laterals are spaced every 5 ft. This system utilizes emitters at each tree or plant as the water application device. Durable, UV resistant tube/tape is used for a multi-year system. This system typically includes all fittings, control valves, pressure reducing/regulating valves, air vacuum release, a filter system (screen/disc), pressure gauges, submains, lateral lines, computerized soil moisture sensors system, and emitters to deliver water to plants at or below the soil infiltration rate on a typical 10 acre site. Does not include Pump, Power source, Water source (well or reservoir). An additional automatic-cleaning sand media filtration system or its equivalent is needed to prevent the passage of solids in sizes or quatities from the water source that might obstruct the emitter openings to ensure proper efficiency and uniformity of irrigation system. The water supply line from the water source to the zone valves is an irrigation pipeline (430) and is not included as part of this system. Water supply is not filtered. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

A container-grown nursery stock has an inefficient sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a ontainer-grown nursery stock. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $134,620.94

**Scenario Cost/Unit:** $13,462.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1800 | $2,754.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 788 | $2,356.12 |
| Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush | 1482 | Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station. | Each | $6,650.72 | 2 | $13,301.44 |
| Micro Irrigation, screen filter, => 100 gpm | 1484 | Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller.?? Unit is complete and installed. Unit price per filter, not per filter station. | Each | $1,048.87 | 1 | $1,048.87 |
| Micro Irrigation, control valves and timers | 1485 | Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled. | Each | $427.50 | 1 | $427.50 |
| Micro Irrigation, emitters or sprays and tubing | 1489 | Emitters or sprays that are installed above ground for micro or drip irrigation. Includes installation and connections to the supply and flushing laterals. Tubing for the emitters is included in this item. | Feet | $1.15 | 95850 | $110,227.50 |
| Water Meter, Microirrigation, >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #10 - Microjet

**Scenario Description:**

A micro-irrigation system, utilizing micro-jets to provide irrigation and\or frost protection for an orchard or other specialty crops grown in a grid pattern. The system is installed with all fittings, control valves, pressure reducing/regulating valves, air/vacuum release, sand media/screen/disc filters, pressure gauges, submains, lateral lines, and micro-jet sprayers to deliver water to the trees. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir). The typical installation is a permanent, microjet -irrigation system installed on a 20 acre orchard. Typical tree spacing is 20' x 20 feet. The water supply line from the water source to the zone valves is an irrigation pipeline (430) and is not included as part of this system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

An orchard has an inefficient irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A micro-spray microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $72,790.18

**Scenario Cost/Unit:** $3,639.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 2700 | $4,131.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 2520 | $7,534.80 |
| Micro Irrigation, screen filter, => 100 gpm | 1484 | Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller.?? Unit is complete and installed. Unit price per filter, not per filter station. | Each | $1,048.87 | 1 | $1,048.87 |
| Micro Irrigation, control valves and timers | 1485 | Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled. | Each | $427.50 | 1 | $427.50 |
| Micro Irrigation, emitters or sprays and tubing | 1489 | Emitters or sprays that are installed above ground for micro or drip irrigation. Includes installation and connections to the supply and flushing laterals. Tubing for the emitters is included in this item. | Feet | $1.15 | 47950 | $55,142.50 |
| Water Meter, Microirrigation, >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #11 - Microjet Filtered

**Scenario Description:**

A micro-irrigation system, utilizing micro-jets to provide irrigation and\or frost protection for an orchard or other specialty crops grown in a grid pattern. The system is installed with all fittings, control valves, pressure reducing/regulating valves, air/vacuum release, sand media/screen/disc filters, pressure gauges, submains, lateral lines, and micro-jet sprayers to deliver water to the trees. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir). The typical installation is a permanent, microjet -irrigation system installed on a 20 acre orchard. Typical tree spacing is 20' x 20 feet. The water supply line from the water source to the zone valves is an irrigation pipeline (430) and is not included as part of this system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

An orchard has an inefficient irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A micro-spray microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $92,742.34

**Scenario Cost/Unit:** $4,637.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 2700 | $4,131.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,893.41 | 1 | $1,893.41 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 2520 | $7,534.80 |
| Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush | 1482 | Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station. | Each | $6,650.72 | 3 | $19,952.16 |
| Micro Irrigation, screen filter, => 100 gpm | 1484 | Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller.?? Unit is complete and installed. Unit price per filter, not per filter station. | Each | $1,048.87 | 1 | $1,048.87 |
| Micro Irrigation, control valves and timers | 1485 | Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled. | Each | $427.50 | 1 | $427.50 |
| Micro Irrigation, emitters or sprays and tubing | 1489 | Emitters or sprays that are installed above ground for micro or drip irrigation. Includes installation and connections to the supply and flushing laterals. Tubing for the emitters is included in this item. | Feet | $1.15 | 47950 | $55,142.50 |
| Water Meter, Microirrigation, >2 in. and <= 8 in., with Volume Totalizer | 2523 | Microirrigation water meter greater than 2 inch and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $2,314.08 | 1 | $2,314.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #12 - Seasonal High Tunnel Micro Irrigation System

**Scenario Description:**

An irrigation system for vegetables or other specialty crops, irrigating inside of a high-tunnel poly-house. Water delivery to the plants by surface lines and/or subsurface applicators. Spacing of the plants will vary, w/ delivery lines spaced 60". Area in question is being converted from other means of less efficient irrigation. Payment includes on-ground mainline and drip tape, fittings, and apurtenances. Pump & supply line is not included in this payment and may be offered through associated practices 533 Pumping plant and 430 Irrigation Pipeline, or existing pump & supply lines will be used. Cost represents typical situations for conventional, organic, and transitioning to organic producers. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

A high tunnel has an inefficient surface irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A microirrigation system is utilized to provide highly efficient irrigation to crops grown in a high tunnel. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Area Sq ft

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,178.00

**Scenario Total Cost:** $250.96

**Scenario Cost/Unit:** $0.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Micro Irrigation, surface drip tubing | 1488 | Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in. | Feet | $0.34 | 458 | $155.72 |
| Micro Irrigation, screen filter, < 100 gpm | 1617 | Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed. | Each | $95.24 | 1 | $95.24 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #33 - Hoop House Surface Microirrigation

**Scenario Description:**

Surface Microirrigation system for 30' x 96' seasonal high tunnel, 24" rows with emmitters on a 12" spacing.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an area. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

**Feature Measure:** Microirrigation area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,880.00

**Scenario Total Cost:** $914.24

**Scenario Cost/Unit:** $0.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.08 | 2880 | $230.40 |
| Micro Irrigation, screen or disc filter, < 3 inch | 2524 | Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only. | Each | $216.68 | 1 | $216.68 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #48 - Small Microirrigation System

**Scenario Description:**

A small scale surface microirrigation system using drip tape or similar type micro-irrigation material placed on the soil surface to irrigate vegetables or field crops. Typically applied on a 40' by 40' plot, with 24" spaced rows, and emitters on a 12" spacing. Submains break plot into several smaller zones. System includes disk filter and chemical injection for chemigation. Water meter is not included. Natural Resource Concern(s): Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533 - Pumping Plant, 449 - Irrigation Water Management, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 328 - Conservation Crop Rotation, and 590 - Nutrient Management.

**Before Situation:**

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a small plot. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on-site water use is reduced.

**Feature Measure:** Microirrigation area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,600.00

**Scenario Total Cost:** $1,699.49

**Scenario Cost/Unit:** $1.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 160 | $244.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 51 | $152.49 |
| Micro Irrigation, drip irrigation system, small scale | 2170 | An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only. | Square Feet | $0.08 | 1600 | $128.00 |
| Micro Irrigation, disk filter, manual flush | 2465 | Disk filter for Micro irrigation system. Includes filter, plumbing, and connections. Unit is complete and installed. Unit is each filter in a filter station that often includes 2 or more filters. | Each | $165.58 | 1 | $165.58 |
| Valve, Double Check Backflow Preventer | 2559 | Designed for installation on potable water lines to protect against both backsiphonage and backpressure of polluted water into the water supply. Includes materials and shipping only. | Each | $348.66 | 1 | $348.66 |
| Micro-irrigation, chemical injection equipment, small scale | 2788 | Chemical injection system includes complete 3/4 inch bypass and suction line kit, injector, appurtenances, backflow prevention, 2 gallon chemigation/fertigation tank. No pump needed. Materials and shipping only. | Each | $128.36 | 1 | $128.36 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #57 - Surface Tape <5 acres

**Scenario Description:**

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual discharge point. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and Facilities. Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

**Before Situation:**

A typical before irrigation situation would normally be an existing inefficient sprinkler or surface irrigation system for vegetable or other crop production system. The existing irrigation system would experience poor, nonuniform irrigation applicatons and significant water losses affecting both water quantity and water quality.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 1/2 acre irrigated field with lateral spacing of 2 feet.

**Feature Measure:** Acres in System

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.50

**Scenario Total Cost:** $2,098.81

**Scenario Cost/Unit:** $4,197.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 49 | $217.07 |
| Micro Irrigation, surface drip tape | 2522 | Tape is installed above ground for surface drip irrigation on annual crops, includes installation, and connections to the supply and flushing laterals.?? Tape is a minimum of 10 mil thick and has emitters built in. | Feet | $0.10 | 11979 | $1,197.90 |
| Micro Irrigation, screen or disc filter, < 3 inch | 2524 | Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only. | Each | $216.68 | 1 | $216.68 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 441 - Irrigation System, Microirrigation

**Scenario** #72 - Small Surface Tape System

**Scenario Description:**

A small scale micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18" to 36". This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual discharge point. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and Facilities. Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

**Before Situation:**

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

**After Situation:**

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 1,600 square feet irrigated field with lateral spacing of 2 feet.

**Feature Measure:** Microirrigation area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,600.00

**Scenario Total Cost:** $1,299.65

**Scenario Cost/Unit:** $0.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 23 | $101.89 |
| Micro Irrigation, disk filter, manual flush | 2465 | Disk filter for Micro irrigation system. Includes filter, plumbing, and connections. Unit is complete and installed. Unit is each filter in a filter station that often includes 2 or more filters. | Each | $165.58 | 1 | $165.58 |
| Micro Irrigation, surface drip tape | 2522 | Tape is installed above ground for surface drip irrigation on annual crops, includes installation, and connections to the supply and flushing laterals.?? Tape is a minimum of 10 mil thick and has emitters built in. | Feet | $0.10 | 880 | $88.00 |
| Valve, Double Check Backflow Preventer | 2559 | Designed for installation on potable water lines to protect against both backsiphonage and backpressure of polluted water into the water supply. Includes materials and shipping only. | Each | $348.66 | 1 | $348.66 |
| Micro-irrigation, chemical injection equipment, small scale | 2788 | Chemical injection system includes complete 3/4 inch bypass and suction line kit, injector, appurtenances, backflow prevention, 2 gallon chemigation/fertigation tank. No pump needed. Materials and shipping only. | Each | $128.36 | 1 | $128.36 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 442 - Sprinkler System

**Scenario** #1 - Center Pivot System

**Scenario Description:**

Installation of a low to medium pressure center pivot system. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Before Situation:**

A 57 acre field is irrigated with traveling guns. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

**After Situation:**

The existing traveling gun irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 885 feet in length with pressure regulators and low to medium pressure sprinklers on drops. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on.

**Feature Measure:** Length of Center Pivot Lateral

**Scenario Unit:** Feet

**Scenario Typical Size:** 885.00

**Scenario Total Cost:** $74,012.51

**Scenario Cost/Unit:** $83.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Irrigation, Center pivot system with appurtenances, fixed cost portion | 317 | Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation. | Each | $5,041.57 | 1 | $5,041.57 |
| Irrigation, Center pivot system with appurtenances, variable cost portion | 318 | Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation. | Feet | $73.96 | 885 | $65,454.60 |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,484.12 | 1 | $3,484.12 |

**Practice:** 442 - Sprinkler System

**Scenario** #2 - Linear Move System

**Scenario Description:**

Installation of a fixed linear or lateral move sprinkler system with sprinklers on drops with or without drag hoses to improve irrigation efficiency and reduce soil erosion. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Before Situation:**

A 76 acre field is irrigated with a traveling gun. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

**After Situation:**

A typical unit is approximately 76 acres in size with the sprinkler system up to 1280 feet in length with drop tubes that have a minimum of 30" spacing. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated.

**Feature Measure:** Length of Linear Move Lateral

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,280.00

**Scenario Total Cost:** $162,284.33

**Scenario Cost/Unit:** $126.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Linear Move System with appurtenances | 322 | Linear/lateral move system including: central tower, lateral towers, pipes, sprinklers, controllers, installation. | Acres | $2,084.83 | 76 | $158,447.08 |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,484.12 | 1 | $3,484.12 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 442 - Sprinkler System

**Scenario** #3 - Renovation of Existing Sprinkler System

**Scenario Description:**

Center Pivot and Linear Move sprinkler systems are used in large crop fields with fairly regular field borders and flat topography. The scenario involves changing nozzles on center pivot or lateral move irrigation systems to low-pressure systems to improve efficiency of water use and reduce energy use. This scenario is intended for cropland areas where the objective is water conservation. A typical scenario assumes a 885 LF span, including end booms renozzled with low-pressure nozzles. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Before Situation:**

A center pivot or lateral move system has high pressure sprinklers. The nozzles are worn and water is applied non-uniformly. Water runs off the field and degrades the receiving waters. Deep percolation in some parts of the field degrades the ground water quality. The runoff from the field causes soil erosion. The high pressure requirement for the system requires excess energy use.

**After Situation:**

A Center Pivot or Linear Move sprinkler system with a span of 885 linear feet is re-nozzled with low-pressure nozzles. The irrigation water is applied efficiently and uniformly to maintain adequate soil moisture for optimum plant growth. Runoff and deep percolation are eliminated, and the surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The lower pressure requirements of the sprinklers reduces the energy used by the pump.

**Feature Measure:** Length of Lateral Retrofitted

**Scenario Unit:** Feet

**Scenario Typical Size:** 885.00

**Scenario Total Cost:** $10,266.14

**Scenario Cost/Unit:** $11.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Aerial lift, telescoping bucket | 1893 | Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only. | Hours | $44.79 | 6 | $268.74 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 7 | $225.54 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |
| **Materials** | | | | | | |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,484.12 | 1 | $3,484.12 |
| Irrigation, Sprinkler Package, Renozzle or Retrofit, with drops and pressure regulators | 1480 | Sprinkler Package - Rennovation including sprinkler nozzle addition, and/or replacement, including new pressure regulators and drops. | Feet | $6.59 | 885 | $5,832.15 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 442 - Sprinkler System

**Scenario** #45 - Center Pivot System (Partial Circle)

**Scenario Description:**

Installation of a low to medium pressure center pivot system on a partial field. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

**Before Situation:**

A 38 acre field is irrigated with traveling guns. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

**After Situation:**

The existing traveling gun irrigation system is converted to a low pressure center pivot. Corners are converted to non-irrigated cropland. The pivot is 1028 feet in length, irrigating less than 1/2 a circle, with pressure regulators and low to medium pressure sprinklers on drops. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on.

**Feature Measure:** Irrigated Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 38.00

**Scenario Total Cost:** $84,588.79

**Scenario Cost/Unit:** $2,226.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Irrigation, Center pivot system with appurtenances, fixed cost portion | 317 | Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation. | Each | $5,041.57 | 1 | $5,041.57 |
| Irrigation, Center pivot system with appurtenances, variable cost portion | 318 | Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers, installation. | Feet | $73.96 | 1028 | $76,030.88 |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,484.12 | 1 | $3,484.12 |

**Practice:** 443 - Irrigation System, Surface and Subsurface

**Scenario** #16 - Ebb and Flow Benches

**Scenario Description:**

Water tight benches, that are housed within the interior of a greenhouse, are installed that re-circulates (ebb and flow) water for irrigation purposes. Typical system consist of bay with three benches 4 feet wide and 100 feet long (1200 sq ft). The bench is flooded then slowly drained to allow water to upflux of water into potted plants located on the bench. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried drainage manifold. This permanent subsurface irrigation system will include a filter station, flow meter, backflow prevention device, automated control box or timer, both a supply and drainage manifold, sump and numerous types of water control valves. This scenario includes all material and labor to install the benches filter and automation system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation Excessive leaching of nutrients into ground and surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 533-Pumping Plant, 620-Underground Outlet

**Before Situation:**

An existing inefficient microirrigation or sprinkler irrigation system in a greenhouse. The existing irrigation system experiences poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality.

**After Situation:**

This highly efficient subsurface irrigation system provides irrigation water directly to the plant root zone by capillary action and recirculates excess water for reuse, eliminating application losses resulting from water leaching through the pot during irrigation or being applied to areas without pots.

**Feature Measure:** Square Feet

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,200.00

**Scenario Total Cost:** $16,946.54

**Scenario Cost/Unit:** $14.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Irrigation Flood Bench system | 2231 | Sliding benches or troughs used for potted plant irrigation. Distribution system is included in benches. Includes materials, labor, and equipment costs. | Square Feet | $13.21 | 1200 | $15,852.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Micro Irrigation, control valves and timers | 1485 | Automatic controller and timer, to turn on and off the sets for micro irrigation, installation and valves. Based on control unit, not number of valves controlled. | Each | $427.50 | 1 | $427.50 |

**Practice:** 447 - Irrigation and Drainage Tailwater Recovery

**Scenario** #11 - Delta Tail Water Pit

**Scenario Description:**

A recovery pit is constructed to temporality store the excess irrigation water and create a pumping pool so that the excess water can be recovered and reused. Typical pit size is trapezoidal ditch with 14ft bottom x 10ft depth x 1750 ft length with 2:1 side slopes. The total yardage of earthwork is 22,037 cy. Construction is typically done with either tractors and pans or with dozer and excavator.

**Before Situation:**

Excess irrigation water collects at lower ends of field and backs up into crops and causes plant stress or causes erosion and travels off farm in a drainage ditch causing water quality issues in lower watersheds. Excess irrigation water and runoff during the off season is not capture and unavailable for use.

**After Situation:**

Excess irrigation water is collected and directed into a recovery system where the water can be recycled and reused for irrigation. Sedimentation has a chance to settle out of the water allowing for less sediment to travel down stream. All runoff has an opportunity to be collected.

**Feature Measure:** Excavated Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 22,307.00

**Scenario Total Cost:** $36,439.83

**Scenario Cost/Unit:** $1.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 22037 | $35,479.57 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 447 - Irrigation and Drainage Tailwater Recovery

**Scenario** #12 - Tailwater Collection Structure

**Scenario Description:**

A collection structure designed and constructed to efficiently direct excess tailwater from a field and deliver into a tailwater recovery ditch or tailwater recovery pit. Typical installation will be a flashboard riser or drop inlet structure placed at edge of field through an earthen berm to direct tailwater into tailwater recovery system. Resource concern(s): Water quality, inefficient use of water. Cost estimate based on 18' weir and 55' long, 15" diameter barrel.

**Before Situation:**

During irrigation, tailwater exits the field in an uncontrolled manner and is being lost downstream and cannot be recovered for future use.

**After Situation:**

Tailwater is collected through structure at a prescribed location and directed into tailwater recovery system for re-use. Other associated practices may include Irrigation reservoir (436), Irrigation and Drainage Tailwater Recovery Pit (447), Surface Drain, Main or Lateral (608), Surface Drain, Field Ditch (607)

**Feature Measure:** weir dia (in) x barrel length (ft)

**Scenario Unit:** Inch-Foot

**Scenario Typical Size:** 990.00

**Scenario Total Cost:** $4,633.54

**Scenario Cost/Unit:** $4.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 100 | $421.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 20 | $128.20 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 2 | $250.22 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in. | 1372 | Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36 | Feet | $5.44 | 10 | $54.40 |
| Pipe, PVC, 18 in., SCH 40 | 1373 | Materials: - 18 inch - PVC - SCH 40 - ASTM D1785 | Feet | $64.60 | 4 | $258.40 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 32 | $146.56 |
| Pipe, PVC, 15 in., SDR 41, PIP | 1718 | Materials: - 15 inch - PVC - SDR 41 100 psi - gasketed PIP ASTM D2241 | Feet | $33.92 | 55 | $1,865.60 |
| Coupling, PVC, Tee, 18x15, SDR 51 | 2365 | Materials: - Tee, 18 inch x 15 inch - PVC - SDR 51 - ASTM F2658 | Each | $741.83 | 1 | $741.83 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #1 - Basic IWM 30 acres or less

**Scenario Description:**

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 30 acre corn field with a surface irrigation system.

**After Situation:**

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $1,070.20

**Scenario Cost/Unit:** $35.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #2 - Basic IWM over 30 acres

**Scenario Description:**

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 50 acre corn field with a sprinkler irrigation system.

**After Situation:**

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $985.04

**Scenario Cost/Unit:** $19.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #3 - Annual Crops, Vegetables, 1st Year

**Scenario Description:**

This practice includes the installation of soil moisture sensors such as tensiometers, gyp blocks, capacitance sensors etc, that are installed and read to determine point in time soil moisture by depth; and the labor of using the equipment over a 12-week growing season for the first year. The installation includes the purchase of soil moisture meters and sensors, installation equipment, and labor to install and utilize sensors and readings in making IWM decisions during first year. Typical Scenario involves installation of resistance sensor blocks in a 20 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors and manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded) during the 12-week growing season. Meters used to read sensors may be portable. Subscription to real-time weather records and rainfall record keeping is used. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 10 acres. Record keeping involves a weekly analysis, monthly documentation, and a year-end report. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 20 acre annual crops with sprinkler or micro irrigation.

**After Situation:**

Producer has installed 2 sensors at each monitoring site at different depths. Producer uses periodic soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $1,578.14

**Scenario Cost/Unit:** $78.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $237.94 | 1 | $237.94 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 4 | $257.72 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #4 - Annual Crops, Vegetables, 1st Year, with Data Logger

**Scenario Description:**

This practice includes the installation of electrical soil moisture sensors such as capacitance or resistance sensors that are monitored to determine soil moisture. The installation includes the purchase of soil moisture sensors, installation equipment (probe or auger), and a data logger to log continuous soil moisture data that can be downloaded to a personal computer and associated graphing software. Scenario also includes the labor associated with using the equipment and readings in making IWM decisions over a 12-week growing season for the first year. Typical Scenario involves installation of resistance sensor blocks in a 20 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors and manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded) during the 12-week growing season. Subscription to real-time weather records and rainfall record keeping is used. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 10 acres. Record keeping involves a weekly analysis, monthly documentation, and a year-end report. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 20 acre annual crops with sprinkler or micro irrigation.

**After Situation:**

Producer has installed 2 sensors at each monitoring site at different depths. Producer periodically downloads continuously recorded soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $2,727.60

**Scenario Cost/Unit:** $136.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Data Logger | 1453 | Data Logger W/Graphic Output for water management. Materials only. | Each | $693.70 | 2 | $1,387.40 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 4 | $257.72 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #5 - Annual Crops, Vegetables, 2nd and 3rd Year

**Scenario Description:**

A system to monitor irrigation water applied to field crops over a 12-week growing season. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 10 acres. Subscription to real-time weather records and rainfall record keeping is used. The producer must manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded). Record keeping involves a weekly analysis, monthly documentation, and a year-end report. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 20 acre anual crops with sprinkler or micro irrigation.

**After Situation:**

Producer uses periodic soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $943.60

**Scenario Cost/Unit:** $47.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #6 - Perennial Crops, Orchards, 1st Year

**Scenario Description:**

This practice includes the installation of soil moisture sensors such as tensiometers, gyp blocks, capacitance sensors etc, that are installed and read to determine point in time soil moisture by depth; and the labor of using the equipment over a 26-week growing season for the first year. The installation includes the purchase of soil moisture meters and sensors, installation equipment, and labor to install and utilize sensors and readings in making IWM decisions during first year. Typical Scenario involves installation of resistance sensor blocks in a 20 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors and manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded) during the 26-week growing season. Meters used to read sensors may be portable. Subscription to real-time weather records and rainfall record keeping is used. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 10 acres. Record keeping involves a weekly analysis, monthly documentation, and a year-end report. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 20 acre perennial crops with sprinkler or micro irrigation.

**After Situation:**

Producer has installed 2 sensors at each monitoring site at different depths. Producer uses periodic soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $1,900.34

**Scenario Cost/Unit:** $95.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $237.94 | 1 | $237.94 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 4 | $257.72 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #7 - Perennial Crops, Orchards, 1st Year, with Data Logger

**Scenario Description:**

This practice includes the installation of electrical soil moisture sensors such as capacitance or resistance sensors that are monitored to determine soil moisture. The installation includes the purchase of soil moisture sensors, installation equipment (probe or auger), and a data logger to log continuous soil moisture data that can be downloaded to a personal computer and associated graphing software. Scenario also includes the labor associated with using the equipment and readings in making IWM decisions over a 26-week growing season for the first year. Typical Scenario involves installation of resistance sensor blocks in a 20 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors and manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded) during the 26-week growing season. Subscription to real-time weather records and rainfall record keeping is used. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 10 acres. Record keeping involves a weekly analysis, monthly documentation, and a year-end report. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 20 acre perennial crops with sprinkler or micro irrigation.

**After Situation:**

Producer has installed 2 sensors at each monitoring site at different depths. Producer periodically downloads continuously recorded soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $3,049.80

**Scenario Cost/Unit:** $152.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Data Logger | 1453 | Data Logger W/Graphic Output for water management. Materials only. | Each | $693.70 | 2 | $1,387.40 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 4 | $257.72 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #8 - Perennial Crops, Orchards, 2nd and 3rd Year

**Scenario Description:**

A system to monitor irrigation water applied to specialty crops over a 26-week growing season. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 10 acres. Subscription to real-time weather records and rainfall record keeping is used. The producer must manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded). Record keeping involves a weekly analysis, monthly documentation and a year-end report. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 20 acre perennial crops with sprinkler or micro irrigation.

**After Situation:**

Producer uses periodic soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $1,265.80

**Scenario Cost/Unit:** $63.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #9 - Field Crops, Grains, 1st Year

**Scenario Description:**

This practice includes the installation of soil moisture sensors such as tensiometers, gyp blocks, capacitance sensors etc, that are installed and read to determine point in time soil moisture by depth; and the labor of using the equipment over a 19-week growing season for the first year. The installation includes the purchase of soil moisture meters and sensors, installation equipment, and labor to install and utilize sensors and readings in making IWM decisions during first year. Typical Scenario involves installation of resistance sensor blocks in a 50 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors and manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded) during the 19-week growing season. Meters used to read sensors may be portable. Subscription to real-time weather records and rainfall record keeping is used. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 25 acres. Record keeping involves a weekly analysis, monthly documentation, and a year-end report. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate his field crops (ex: corn, soybeans, wheat) based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 50 acre corn field with sprinkler irrigation.

**After Situation:**

Producer has installed 2 sensors at each monitoring site at different depths. Producer uses periodic soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $1,076.79

**Scenario Cost/Unit:** $21.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4.75 | $153.05 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $237.94 | 1 | $237.94 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 4 | $257.72 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #10 - Field Crops, Grains, 1st Year, with Data Logger

**Scenario Description:**

This practice includes the installation of soil moisture sensors such as tensiometers, gyp blocks, capacitance sensors etc, that are installed and read to determine point in time soil moisture by depth; and the labor of using the equipment over a 19-week growing season for the first year. The installation includes the purchase of soil moisture sensors, installation equipment (probe or auger), and a data logger to log continuous soil moisture data that can be downloaded to a personal computer and associated graphing software. Scenario also includes the labor associated with using the equipment and readings in making IWM decisions over a 19-week growing season for the first year.Typical Scenario involves installation of resistance sensor blocks in a 50 acre field of irrigated cropland. Producer periodically monitors data lo manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded) during the 19-week growing season. Meters used to read sensors may be portable. Subscription to real-time weather records and rainfall record keeping is used. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 25 acres. Record keeping involves a weekly analysis, monthly documentation, and a year-end report. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate his field crops (ex: corn, soybeans, wheat) based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 50 acre corn field with sprinkler irrigation.

**After Situation:**

Producer has installed 2 sensors at each monitoring site at different depths. Producer uses periodic soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Area Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $2,226.25

**Scenario Cost/Unit:** $44.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4.75 | $153.05 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Data Logger | 1453 | Data Logger W/Graphic Output for water management. Materials only. | Each | $693.70 | 2 | $1,387.40 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 4 | $257.72 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #11 - Field Crops, Grains, 2nd and 3rd Year

**Scenario Description:**

A system to monitor irrigation water applied to field crops over a 19-week growing season. Soil moisture data is reviewed 3 times per week at each sensor site (two sensors per site) with one sensor site per 25 acres. Subscription to real-time weather records and rainfall record keeping is used. The producer must manually turn on and off the water supply in accordance with the soil moisture readings and keep records for each irrigation cycle (run time, inches applied, and total flow recorded). Record keeping involves a weekly analysis, monthly documentation, and a year-end report. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

The farmer decides when to irrigate his field crops (ex: corn, soybeans, wheat) based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 50 acre corn field with sprinkler irrigation.

**After Situation:**

Producer has installed 2 sensors at each monitoring site at different depths. Producer uses periodic soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

**Feature Measure:** Irrigated Are Managed

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $581.13

**Scenario Cost/Unit:** $11.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4.75 | $153.05 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #17 - 1st Year, Computer Record Keeping System

**Scenario Description:**

This practice includes the installation of a computer-based system and weather station that is monitored to determine crop water use, status of heat and/or frost conditions to permit the producer to make informed irrigation decisions of high value crops. Data is automatically transmitted from diaelectric soil moisture sensors to a computer program that recommends irrigation cycles based on actual soil moisture conditions and local weather data. Requires manually turning on and off the water supply according to system recommendations. The installation includes the purchase and installation of equipment, and a data logger to log continuous weather data including rainfall, temp, solar radiation, humidity, wind speed and soil moisture sensors that can be downloaded to a personal computer and associated graphing software. Typical Scenario involves installation on a 25 acre field of irrigated cropland. Producer periodically monitors the station during the growing season to determine timing and amounts of water to apply based on soil moisture sensors, field checks and weather station data. Producer keeps records of collected data and resulting irrigation decisions. This scenario only applies to year one of IWM. The appropriate labor-only IWM scenario applies in subsequent contract years. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Water Quality; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface

**Before Situation:**

To meet crop water requirements, the producer schedules irrigations based on the calendar and what has apparently worked in the past. For cooling/frost protection, irrigation start and run times are based on broad regional weather forecasts.

**After Situation:**

Producer has installed a weather station and periodically downloads continuously recorded data that is used to schedule irrigation more effectively resulting in improved irrigation water management and reduced energy use. Field checks are made by irrigator to ground truth station data with crop.

**Feature Measure:** Acreage of cropfield

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $10,546.50

**Scenario Cost/Unit:** $421.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Switches and Controls, temp sensors | 1192 | Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $697.95 | 1 | $697.95 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,660.98 | 1 | $1,660.98 |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $237.94 | 1 | $237.94 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 2 | $128.86 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 449 - Irrigation Water Management

**Scenario** #18 - Use Computer Record Keeping System

**Scenario Description:**

Irrigation water is applied to high value crops based on data automatically transmitted from diaelectric soil moisture sensors to a computer program that recommends irrigation cycles based on actual soil moisture conditions and local weather data. This scenario assumes all system components are in place (sensors, transmitter, etc.) Requires manually turning on and off the water supply according to system recommendations. Includes monthly recording of flowmeter readings and the time to manage and monitor the system for the entire growing system. Records are kept to compare system recommendations to actual application rates from flow meter data. Typical Scenario involves installation on a 25 acre field of irrigated cropland. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Water Quality; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities. Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface

**Before Situation:**

To meet crop water requirements, the producer schedules irrigations based on the calendar and what has apparently worked in the past. For cooling/frost protection, irrigation start and run times are based on broad regional weather forecasts.

**After Situation:**

Producer has an installed weather station and periodically downloads continuously recorded data that is used to schedule irrigation more effectively resulting in improved irrigation water management and reduced energy use. Field checks are made by irrigator to ground truth station data with crop.

**Feature Measure:** Acre of cropfield

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $1,685.64

**Scenario Cost/Unit:** $67.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** 450 - Anionic Polyacrylamide (PAM) Application

**Scenario** #7 - PAM Application

**Scenario Description:**

Control of irrigation induced erosion (typically in furrow irrigated fields) through the direct application of water-soluble Polyacrylamide (PAM) into the irrigation water supply (1 to 3 ounce sprinkled at 3-5 ft furrow inlet or metered at 10 ppm directly into the head ditch). PAM comes in granular, liquid oil emulsion, tablet, and block forms. This typical application is for an 80-acre furrow irrigated row crop field, with one PAM application (1-1.5 lb/ac, creating a 10 ppm concentration of the granular PAM in the head ditch metered via large fish feeder) at first irrigation followed by two additional applications (reduced rates of 0.5-1 lb/ac, or about 1-5 ppm in the inflow water) after cultivations. Resource Concern: Soil erosion. Associated Practices: 443-Irrigation System, Surface and Subsurface, 449-Irrigation Water Management.

**Before Situation:**

Irrigated lands susceptible to irrigation-induced erosion, excluding peat soils, and where the sodium adsorption ratio (SAR) of irrigation water is less than 15.

**After Situation:**

Erosion is minimized in furrow irrigated field.

**Feature Measure:** Weight of PAM Applied

**Scenario Unit:** Pound

**Scenario Typical Size:** 240.00

**Scenario Total Cost:** $1,862.64

**Scenario Cost/Unit:** $7.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| **Materials** | | | | | | |
| Anionic Polyacrylamide (PAM) | 1279 | Water Soluble PAM, granular bulk, for mixing with irrigation water. Includes materials and shipping only. | Pound | $6.15 | 240 | $1,476.00 |

**Practice:** 460 - Land Clearing

**Scenario** #1 - Non-Heavy Equipment

**Scenario Description:**

Site preparation of a field with a labor crew, chainsaws, chippers or similar equipment removing trees and shrubs to achieve a conservation objective. Typical scenario is approximately 1 acre of trees and shrubs to be cleared. The resource concern is determined by the conservation objective met with the final practice applied to the field.

**Before Situation:**

Forested field of approximately 1 acre, with moderate density evenly spaced tree canopy.

**After Situation:**

Labor crew uses chainsaws, chippers, or similar equipment to clear trees and prepare the field for a conservation objective, includes on-site disposal as necessary. Associated practices, like plantings, other structures, or irrigation/drainage water management practices, would be contracted separately as needed.

**Feature Measure:** Area Cleared

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,002.32

**Scenario Cost/Unit:** $1,002.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 24 | $159.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 460 - Land Clearing

**Scenario** #2 - Heavy Equipment

**Scenario Description:**

Site preparation of a field with dozer or equivalent heavy equipment to acheive a conservation objective. Typical scenario is approximately 5 acres of trees and shrubs to be cleared. The resource concern is determined by the conservation objective met with the final practice applied to the field.

**Before Situation:**

Forested field of approximately 5 acres, with moderate density evenly spaced tree canopy.

**After Situation:**

Crew uses 200 HP dozer to clear trees and prepare field for conservation objective, includes on-site debris disposal as necessary. Associated practices, like plantings, other structures, or irrigation/drainage water management practices, would be contracted separately as needed.

**Feature Measure:** Area Cleared

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $5,820.93

**Scenario Cost/Unit:** $1,164.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 20 | $3,700.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 20 | $996.20 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 462 - Precision Land Forming and Smoothing

**Scenario** #9 - Minor Shaping

**Scenario Description:**

The land surface is shaped or leveled to a specific elevation and grade for various land uses. Cuts and fills are small. The resource concerns are EXCESS / INSUFFICIENT WATER -( Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

**Before Situation:**

The field has minor topographic issues or problems with surface drainage or erosion which can be corrected without land leveling or land smoothing. Site conditions require attention to elevation and grade. Typical situation is a 5 acre field. Material to be moved and or placed typically around 100 cubic yards per acre.

**After Situation:**

Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted seperately as needed.

**Feature Measure:** Acres of land treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $2,319.81

**Scenario Cost/Unit:** $463.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 6 | $605.64 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 6 | $347.10 |
| Scraper, pull, 7 CY | 1206 | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hours | $18.28 | 6 | $109.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 462 - Precision Land Forming and Smoothing

**Scenario** #10 - Site Stabilization

**Scenario Description:**

The site contains a gully or other site specific topographic problem. Site conditions require attention to elevation and grade. Resource concerns are EXCESS / INSUFFICIENT WATER -( Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

**Before Situation:**

The site, commonly a crop field or CAFO, has localized gully or topographic issues causing drainage or erosion problems. Typical situation is a gully 10 feet wide and 5 feet deep.

**After Situation:**

Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted seperately as needed.

**Feature Measure:** Cubic yards of material placed

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 6,000.00

**Scenario Total Cost:** $15,611.47

**Scenario Cost/Unit:** $2.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 6000 | $15,360.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 462 - Precision Land Forming and Smoothing

**Scenario** #47 - Minor Shaping - Field Scale

**Scenario Description:**
Removing irregularities on the land surface of cropland by use of heavy equipment.

**Before Situation:**
Field damaged by flooding, past agricultural practices, or other topographic issues causing drainage or field workability issues. Typically less than 100 cy/acre material moved.

**After Situation:**
Land level, backhoe, bulldozer or other heavy equipment used to correct irregularities and address drainage or workability issues.

**Feature Measure:** Acres of land treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $4,225.75

**Scenario Cost/Unit:** $105.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 25 | $2,523.50 |
| Scraper, pull, 7 CY | 1206 | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hours | $18.28 | 25 | $457.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 25 | $1,245.25 |

**Practice:** 464 - Irrigation Land Leveling

**Scenario** #16 - Small Scale Irrigation Land Leveling

**Scenario Description:**

This is scenario will level a typical 10 acres of irrigated crop land surface to enhance uniform flow of surface water to improve irrigation efficiency using dirtpans/carry-all/pan-scraper equipment. The typical volume of earth moved is 100 to 500 cubic yards per acre. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.

**Before Situation:**

Irregular field surface reduces uniformity of surface application and thus irrigation efficiency by localized ponding and/or excess runoff/run-on.

**After Situation:**

Cropland will be reshaped to provide uniform distribution of irrigation water in order to promote irrigation efficiencies.

**Feature Measure:** Acres of Area

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $11,200.26

**Scenario Cost/Unit:** $1,120.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4000 | $10,240.00 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 464 - Irrigation Land Leveling

**Scenario** #27 - Irrigation Land Leveling

**Scenario Description:**

This is scenario will level a typical 80 acres of irrigated crop land surface to enhance uniform flow of surface water to improve irrigation efficiency using dirtpans/carry-all/pan-scraper equipment. The typical volume of earth moved is 100 to 500 cubic yards per acre. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.

**Before Situation:**

Irregular field surface reduces uniformity of surface application and thus irrigation efficiency by localized ponding and/or excess runoff/runon.

**After Situation:**

Cropland will be reshaped to provide uniform distribution of irrigation water in order to promote irrigation efficiencies.

**Feature Measure:** Volume of Earth Moved

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 28,000.00

**Scenario Total Cost:** $72,018.28

**Scenario Cost/Unit:** $2.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 28000 | $71,680.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #1 - Turf Reinforced Matting Regional

**Scenario Description:**

Existing channel has excessive erosion and design velocities exceed the use of vegetation. Rock riprap is not readily available or too costly. TRM(Turf Reinforced Matting) works with vegetation to provide a long term solution for high velocity situations. TRM is typically installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, and furnishing, installing TRM and vegetation establishment. Lined waterway width is measured from top of bank to top of bank. If non-TRM areas exist use Mulching (484). Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), Grassed Waterway (412), Lined Outlet (468),and Critical Area Seeding (342).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Effective soil stress and velocities are generally too high to establish a grassed waterway.

**After Situation:**

A 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined was installed with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. The practice is installed using a dozer, loader, or excavator. Site prepared for vegetation establishment including seed. lime, fert., etc. TRM is installed by laborers. If non-TRM areas exist, use Mulching (484). The material provides immediate and long-term protection against scouring of the channel.

**Feature Measure:** Square Foot of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $7,147.76

**Scenario Cost/Unit:** $1.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 125 | $320.00 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.1 | $1.32 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.1 | $0.73 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.1 | $2.23 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 0.1 | $0.91 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 83 | $75.53 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 3 | $3.06 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 6 | $6.06 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 6 | $3.54 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 0.2 | $21.83 |
| Turf reinforcement mat | 1212 | Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor. | Square Yard | $12.46 | 500 | $6,230.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 0.1 | $8.44 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #2 - Rock Lined - 12 inch

**Scenario Description:**

Rock Riprap is installed over 100% of the width of the waterway to prevent scour. Velocity of around 8'/sec dictates 9" rock. Cost includes excavation, spoiling of excess material, geotextile underlayment and installing Rock Riprap. Lined waterway width is measured from inside top to inside top of lined channel, typically top of bank. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), Grassed Waterway (412), Lined Outlet (468),and Critical Area Seeding (342).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Effective soil stress and velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

**After Situation:**

Installed a 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 12", Velocity ~ 8 ft/sec). 3/4 the channel depth is excavated. Excess excavation is spoiled in the immediate area. Geotextile underlayment is installed by laborers. Completed rock protects channel against future scour and keeps sediment out of the water course and water bodies.

**Feature Measure:** Square Foot of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $27,846.79

**Scenario Cost/Unit:** $6.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 250 | $640.00 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 21 | $2,794.05 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 21 | $1,984.71 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 21 | $676.62 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 42 | $2,092.02 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 100 | $2,488.00 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 312 | $16,507.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #3 - Rock Lined - 24 inch

**Scenario Description:**

Riprap is installed over 100% of the width of the waterway to prevent scour. Velocity of around 11'/sec dictates 18" rock. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18" Rock Riprap. Lined waterway width is measured from inside top to inside top of lined channel, typically top of bank. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), Grassed Waterway (412), Lined Outlet (468),and Critical Area Seeding (342).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Effective soil stress and velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

**After Situation:**

Installed a 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 18", Velocity ~ 11 ft/sec). 3/4 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers.

**Feature Measure:** Square Foot of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $47,373.46

**Scenario Cost/Unit:** $10.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 417 | $1,067.52 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 38 | $5,055.90 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 38 | $3,591.38 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 38 | $1,224.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 76 | $3,785.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 5 | $267.55 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 84 | $2,089.92 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 563 | $29,788.33 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #4 - Rock, Grouted

**Scenario Description:**

Rock Riprap is installed over 100% of the width of the waterway to prevent scour. Velocity of around 8'/sec dictates 9" rock. Rock of this size not readily available, therefore must also grout rock with cement. Cost includes excavation, spoiling of excess material, geotextile underlayment installing Rock Riprap and grouting with cement. Lined waterway width is measured from inside top to inside top of lined channel, typically top of bank. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), Grassed Waterway (412), Lined Outlet (468),and Critical Area Seeding (342).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Effective soil stress and velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

**After Situation:**

Installed a 100 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 12", Velocity ~ 8 ft/sec). 3/4 the channel depth is excavated. Excess excavation is spoiled in the immediate area. Geotextile underlayment is installed by laborers. Completed rock also grouted to protect channel against future scour and keeps sediment out of the water course and water bodies.

**Feature Measure:** Square Foot of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $13,568.16

**Scenario Cost/Unit:** $9.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 84 | $215.04 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 1 | $94.51 |
| Rock Riprap, grouted | 1757 | Grouted Rock Riprap, includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $159.63 | 70 | $11,174.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 1 | $49.81 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 34 | $845.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #5 - Grassed waterway with stone center

**Scenario Description:**

Typical practice is 1244 ' long by 35' wide by 1.2' deep parabolic channel. 50% of width lined with rock riprap. A waterway that is a shaped or graded channel and is established with suitable vegetation on sides included in cost and center with rock riprap to carry surface water at a non-erosive velocity to a stable outlet. Installation of 50% of width allows higher velocity but size is based on vegetative values. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank toSubu top of bank. Costs include excavation and associated work to construct the overall shape and grade of the waterway and install rock. Cost for waterway included SF of installed rock. Associated Practices: Diversion (362), Critical Area Seeding (342), Mulching (484), Underground Outlet (620), Structure for Water Control (587), Subsurface Drainage (606), Water and Sediment Control Basin (638).

**Before Situation:**

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Stone center waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet when velocities are slightly higher than allowed for grassed waterway.

**After Situation:**

Installed waterway is 1244' long by 35' wide by 1.2' deep parabolic earthen channel. 50% of width has rock rip-rap installed. Non rock area to be seeded, lime, fertilizer, etc to establish vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484) for remaining 50%. Rock center generally eliminates need for Drainage tile,but if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

**Feature Measure:** SF of installed Rock Riprap

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 21,780.00

**Scenario Total Cost:** $142,490.67

**Scenario Cost/Unit:** $6.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 10 | $1,251.10 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.5 | $6.61 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.5 | $3.63 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.5 | $11.14 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 0.5 | $4.55 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 806 | $733.46 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 776 | $1,264.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 940 | $137,963.80 |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 15 | $15.30 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 30 | $30.30 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 30 | $17.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 1 | $109.15 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 0.5 | $42.21 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #15 - Concrete

**Scenario Description:**

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with concrete. 1/2 the channel is excavated, before excavation for concrete and subgrade material. Excess excavation is spoiled in the immediate area. Concrete is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, 6" of clean sand or gravel subgrade, and 5" reinforced concrete slab. Lined waterway width is measured from top of bank to top of bank.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

**After Situation:**

Concrete lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated using a hydraulic excavator. Concrete slab is placed on 6" of clean sand or #57 stone. Concrete is placed, graded and screeded by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Feature Measure:** Square Foot of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $37,510.23

**Scenario Cost/Unit:** $8.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 80 | $32,944.00 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 280 | $716.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 110 | $3,426.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #23 - Concrete Block

**Scenario Description:**

Install 36' long (including inlet and outlet aprons) by 15' wide by 1.5' deep trapezoidal shaped waterway or chute lined with concrete blocks. 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. 8"x8"x16" standard concrete blocks are installed over 100% of the width of the waterway/chute to prevent scour. Cost include excavation, spoiling of excess material, 3" stone subgrade, geotextile and furnishing and installing standard concrete blocks. Lined waterway width is measured from top of bank to top of bank.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

**After Situation:**

Conccrete block lined waterway or chute is 36 ' long by 15' wide by 1.5' deep. Chute is installed on a 3 to 1 slope. The practice is installed using a hydraulic excavator. Geotextile and concrete blocks are installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Feature Measure:** Square Foot of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 540.00

**Scenario Total Cost:** $2,977.69

**Scenario Cost/Unit:** $5.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 65 | $92.30 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 32 | $81.92 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 6 | $186.90 |
| Block, concrete | 253 | Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only | Each | $2.32 | 640 | $1,484.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #32 - Rock Lined, 12 inch

**Scenario Description:**

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 9", Velocity ~ 8 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 9" Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

**After Situation:**

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

**Feature Measure:** Square Foot of Waterway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $31,265.98

**Scenario Cost/Unit:** $6.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 295 | $755.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 205 | $30,087.85 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 472 - Access Control

**Scenario** #1 - Monitoring and maintenance of sensitive areas

**Scenario Description:**

Labor and increased time needed to control and re-route animals and traffic from sensitive areas, monitor and maintain barriers. Resource concerns include Excessive sediment in surface waters, Habitat degradation for fish and wildlife, and Undesirable plant productivity and health.

**Before Situation:**

The application of access control has resulted in increased labor and time to re-route traffic and animals from a riparian area that splits a field in half. This has also lead to more time and labor in monitoring the animals, inspecting and repairing the barrier.

**After Situation:**

Water quality is maintained, habitat is improved, and plant health is maintained by controlling access to the riparian area.

**Feature Measure:** Area of sensitive area

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $705.23

**Scenario Cost/Unit:** $705.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 8.5 | $170.17 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| **Materials** | | | | | | |
| Post, Wood, CCA treated, 5 in. x 8 ft. | 11 | Wood Post, End 5 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $19.84 | 2 | $39.68 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 1 | $260.18 |

**Practice:** 484 - Mulching

**Scenario** #1 - Natural Material - Full Coverage

**Scenario Description:**

Application of straw mulch or other other state approved natural material to reduce erosion and facilitate the establishment of vegetative cover. Mulch provides full coverage and is typically used with critical area planting. Assumes 125 bales/acre (3 bales/1000 sq ft)

**Before Situation:**

Typical scenario ranges from a 0.1 to 1.0 acre disturbed site around a newly constructed structural practice. The potential for soil erosion is high and mulch is needed to stabilize the soil and facilitate the establishment of vegetative cover.

**After Situation:**

Straw mulch has been applied to areas needing mulch. Erosion and sedimentation is reduced, water and soil quality is protected, and vegetative cover is established.

**Feature Measure:** Area Covered by Mulch

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $615.33

**Scenario Cost/Unit:** $615.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $107.37 | 2.5 | $268.43 |

**Practice:** 484 - Mulching

**Scenario** #2 - Erosion Control Blanket

**Scenario Description:**

Installation of erosion control blanket on critical areas with steep slopes, grassed waterways or diversions.. Blanket is typically made of coconut coir, wood fiber, straw and is typically covered on both sides with polypropylene netting. Used to help control erosion and establish vegetative cover.

**Before Situation:**

There are areas of concentrated flow and a grassed waterway is being installed. Soil erosion is a concern and there is little to no vegetation.

**After Situation:**

The erosion control blanket is placed on concentrated flow areas and secured with ground stables. Soil erosion is minimized and vegetative cover is established.

**Feature Measure:** Area Covered by Mulch

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,000.00

**Scenario Total Cost:** $1,202.96

**Scenario Cost/Unit:** $0.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.70 | 556 | $945.20 |

**Practice:** 484 - Mulching

**Scenario** #3 - Synthetic Material

**Scenario Description:**

Installation of geotextile, biodegradable plastic, polyethylene plastic, or other state approved synthetic mulch to conserve soil moisture, moderate soil temperature, and provide erosion control. Payment based on actual area covered by mulching material.

**Before Situation:**

Site conditions very. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

**After Situation:**

Synthetic mulch is applied in rows with a mulch layer or by other mechanized means. Soil moisture is conserved, and energy use associated with irrigation is decreased.

**Feature Measure:** Area Covered by Mulch

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,872.80

**Scenario Cost/Unit:** $6,872.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 4840 | $6,872.80 |

**Practice:** 484 - Mulching

**Scenario** #4 - Tree and Shrub

**Scenario Description:**

Fabric or other suitable natural or synthetic mulch is installed with a new tree and shrub planting to facilitate growth. Rate is per tree/shrub and assumes 1 square yard of barrier fabric and 5 staples/tree.

**Before Situation:**

Site conditions vary. Typical scenario is an installation of 100 native trees and shrubs to enhance wildlife habitat. Sites are often remote and trees may not be planted in rows, requiring each tree to be mulched individually

**After Situation:**

Barrier fabric squares are installed with 5 sod staples each, around individual trees and shrubs to facilitate growth. Desirable vegetation is established.

**Feature Measure:** Number of Trees Mulched

**Scenario Unit:** Each

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $142.00

**Scenario Cost/Unit:** $1.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 100 | $142.00 |

**Practice:** 484 - Mulching

**Scenario** #5 - Leaf Mulching

**Scenario Description:**

Municipally collected leaves are loaded into a manure spreader with a front-end loader and spread on a 15 acre field that is annually planted to a low residue crop (such as vegetables, silage, and soybeans). The leaves are typically delivered and stockpiled no more than seven days then spread with a manure spreader at a rate of 8-10 tons/acre. The typical depth is 3 to 6 inches. The leaves provide a protective mulch layer over winter until it is time to prepare the field for the subsequent crop.

**Before Situation:**

An annually planted 15 acre field is planted with low residue crops such as vegetables, silage and soybeans. The field is tilled in the fall immediately following harvest resulting in bare soil subject to soil erosion and organic matter depletion over time.

**After Situation:**

Municipally collected leaves are spread on a 15 acre field with a typical depth of 3 to 6 inches. The leaves provide a protective mulch layer over winter until it is time to prepare the field for the subsequent crop. The leaf mulch layer provides soil cover which reduces soil erosion.

**Feature Measure:** Acre of land with applied leaf mulc

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $1,382.29

**Scenario Cost/Unit:** $92.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 11.25 | $1,382.29 |

**Practice:** 484 - Mulching

**Scenario** #6 - Wood Chips

**Scenario Description:**

Application of wood chips around trees, shrubs, or potted grass plantings to reduce erosion, and facilitate the establishment of vegetative cover. Mulch provides full coverage and is typically used with critical area planting. Assumes one (1) cubic yard of wood chips per 100 square feet of area. Associated practices: Hedgerow Planting (422), Windbreak (380), Waste Storage Facility (313),etc.

**Before Situation:**

Typical scenario ranges from a 0.1 to 1.0 acre of recently disturbed soil where vegetation has been planted or a structure has been built. The potential for soil erosion is high and mulch is needed to stabilize the soil and facilitate the establishment of vegetative cover.

**After Situation:**

Wood chips has been applied to areas needing mulch. Erosion and sedimentation is reduced, water and soil quality is protected, and vegetative cover is established.

**Feature Measure:** Area Mulched

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $621.62

**Scenario Cost/Unit:** $0.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 10 | $564.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #1 - Mechanical, Heavy

**Scenario Description:**

This practice involves the use of heavy machinery to treat an area in order to improve site conditions for establishing trees and/or shrubs. Typical sites include trees and brush cover that is not appropriate to the site or providing the desired condition for the landowner. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition and soil quality degredation - soil erosion - sheet and rill. Associated Practices: Tree/Shrub Establishment(612)

**Before Situation:**

The site is dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush) occupying the site. There is also a significant component of woody debris onsite. Noxious and invasive species may also be present on the site. Soils are compacted as a result of past heavy equipment activities or from other land uses. Sheet and rill erosion is ocurring in areas where the soil was severely disturbed expsoing bare soil. If left untreated, soil compaction and erosion issues will result in poor survival or reduced growth of trees/shrubs to be established on the site.

**After Situation:**

Undesirable vegetation has been removed using mechanical methods reducing competition for target trees and/or shrubs. Woody debris has been removed to facilitate tree/shrub planting operations. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 40 acres.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $11,617.73

**Scenario Cost/Unit:** $290.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Heavy mechanical site prep, shearing, V-blade, K-G blading | 1314 | Mechanical operations that shear trees and vegetation. Requires heavy equipment such as dozers, Includes equipment, power unit and labor costs. | Acres | $221.54 | 24 | $5,316.96 |
| Heavy mechanical site prep, raking | 1317 | Mechanical operations that pushing and raking trees and vegetation. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs. | Acres | $213.95 | 24 | $5,134.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #2 - Mechanical, Light

**Scenario Description:**

This practice involves the use of light/moderate machinery to clear above ground vegetation and to also rip/cut/lift underground root systems in order to improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health and inadequate structure and composition. Associated Practices: Tree/Shrub Establishment(612)

**Before Situation:**

Undesirable vegetation is present on the site including herbaceous plants and sparse woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of harvesting heavy equipment activities or other land uses.

**After Situation:**

Undesirable vegetation has been removed using a bush hog to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18" deep), thus enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 20 acres.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $1,830.42

**Scenario Cost/Unit:** $91.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 10 | $306.20 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #3 - Chemical, Ground Application

**Scenario Description:**

This practice involves the use of various herbicides applied using ground-based machinery (and some hack-n-squirt treatment of select trees) in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestland that was recently harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition. Associated Practices: Tree/Shrub Establishment(612)

**Before Situation:**

Undesirable vegetation is present on the site including herbaceous plants and woody vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

**After Situation:**

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $9,410.35

**Scenario Cost/Unit:** $235.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 20 | $1,316.20 |
| Chemical, ground application, forested land | 1313 | Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs | Acres | $146.47 | 40 | $5,858.80 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 40 | $667.20 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 4 | $156.88 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 40 | $89.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #4 - Chemical, Aerial Application

**Scenario Description:**

This practice involves the use of herbicides applied by helicoptor in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. This typical scenraio includes open land such as abandoned fields, pastures or forestlands that were recently harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition. Associated Practices: Tree/Shrub Establishment(612)

**Before Situation:**

Undesirable vegetation is present on the site including herbaceous plants and woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

**After Situation:**

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $2,567.20

**Scenario Cost/Unit:** $64.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, aerial application, helicopter | 1991 | Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor. | Acres | $45.26 | 40 | $1,810.40 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 40 | $667.20 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 40 | $89.60 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #5 - Chemical, Hand Application

**Scenario Description:**

This practice involves the use of various herbicides applied using backpack sprayer or similar equipment, and hack-n-squirt for tree control, in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include lands such as old fields, pastures, rangelands, agricultural fields, previous forestlands that have been abandoned and are now covered with a mixture of grasses, forbs, shrubs and some remnant trees. Resource concerns are: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition. Associated Practices: Tree/Shrub Establishment(612)

**Before Situation:**

Undesirable vegetation, including woody and herbaceous plants, occupy 100 % of the on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

**After Situation:**

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 40 acres.

**Feature Measure:** area of treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $4,549.64

**Scenario Cost/Unit:** $113.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 40 | $2,632.40 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Herbicide, 2,4-D + Dica | 331 | Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Materials and shipping. | Acres | $13.85 | 40 | $554.00 |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 4 | $203.44 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 40 | $89.60 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #6 - Hand site preparation

**Scenario Description:**

This practice typically involves grubbing all vegetation from the area of ground prior to the establishment of trees and/or shrubs. Typical sites include land such as old fields, pastures, rangelands, agricultural fields, or abandoned forests that are mostly grass or weed covered. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure. Associated Practices: Tree/Shrub Establishment(612)

**Before Situation:**

The site contains undesirable vegetation including herbaceous and woody plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of recent timber harvesting activities or other land uses. If left untreated poor survival or reduced growth of trees/shrubs will occur and wildlife habitat conditions will not improve.

**After Situation:**

All undesirable vegetation has been grubbed out of a 4 ft by 4 ft area, leaving bare soil, at each planting spot. Tree seedlings and/or shrubs are planted at each spot. Adequate moisture, space and light is available allowing plants to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 10 acres.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $3,056.34

**Scenario Cost/Unit:** $305.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 55 | $1,772.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #7 - Windbreak, Site Preparation

**Scenario Description:**

This practice involves the use of various chemical/tillage methods to allow for the planting of a windbreak. Site preparation includes chemically killing vegegation prior to mechanical site preparation that includes appropriate methods to allow for planting of the site which may include one or all of the following, ripping, disking, and harrowing. This practice may be applied on all lands needing treatment to facilitate establishment of trees and/or shrubs to facilitate establishment of a windbreak. Typical sites include open land such as old fields, pastures, rangelands and agricultural fields. Resource concerns: Soil erosion--Wind erosion, . Associated Practices: Tree/Shrub Establishment(612)

**Before Situation:**

Undesirable vegetation, including woody and herbaceous plants, is present on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soil is compacted as a result of prior land management activities.

**After Situation:**

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 1.5 acres.

**Feature Measure:** area of treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $393.91

**Scenario Cost/Unit:** $196.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1.5 | $19.82 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1.5 | $9.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Herbicide, 2,4-D | 330 | Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $13.82 | 1.5 | $20.73 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1.5 | $25.02 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1.5 | $3.36 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #29 - ARRI Spray and Cross Rip

**Scenario Description:**

Reforestation of site desired, but soil compaction due to past mining operations and undesirable species severely restrict growth of native trees and shrubs. Site is sprayed with herbicide in summer to kill existing vegetation, and then cross-ripped on an 8' x 8' grid with a 4' single shank ripper using a D9 dozer. Cross-ripping on sloped areas is done on the contour to minimize erosion. This scenario refelicts work being done through the Appalchian Regional Reforestation Initiative (ARRI) . http://arri.osmre.gov/fra/advisories/fra_no.4.pdf

**Before Situation:**

Site has undesirable herbaceous vegetation and severely compacted soils that restrict survivability and growth of planted trees and shrubs.

**After Situation:**

Existing vegetation has been killed by herbicide treatment, and soil compaction has been treated on an 8' x 8' grid by cross-ripping. Planted trees and/or shrubs can establish root systems that support surivivability and growth, and ultimately result in reforestation.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $3,838.69

**Scenario Cost/Unit:** $767.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 10 | $1,850.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 10 | $498.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 5 | $83.40 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 5 | $11.20 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #54 - Tree-Shrub Site Prep - small acreage

**Scenario Description:**

This practice involves the use of various chemical and tillage methods to allow for the planting of agroforestry practices and hedgerows. Site preparation includes chemically killing vegetation prior to mechanical site preparation that includes appropriate methods to allow for planting of the site which may include one or all of the following: ripping, disking, and harrowing. This practice may be applied on all lands needing treatment to facilitate establishment of trees and shrubs to facilitate establishment of agroforestry practices (alley cropping, forest farming, riparian forest buffer, silvopasture, and windbreak) and hedgerows. Resource concern: Soil erosion - wind erosion.

**Before Situation:**

Undesirable vegetation, including woody and herbaceous plants, is present on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees or shrubs. Soil is compacted as a result of prior land management activities.

**After Situation:**

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and shrubs. Site conditions are favorable for successful establishment of trees and shrubs. The typical size is less than one acre.

**Feature Measure:** Area of treatment

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $363.20

**Scenario Cost/Unit:** $3.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.5 | $6.61 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.5 | $3.03 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Herbicide, 2,4-D | 330 | Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $13.82 | 0.5 | $6.91 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 0.5 | $8.34 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 0.5 | $1.12 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 500 - Obstruction Removal

**Scenario** #1 - Removal and Disposal of Brush and Trees < 6 inch Diameter Regional

**Scenario Description:**

Remove and disposal of brush and trees < 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Contour Farming (330), Diversion (362), Early Successional Habitat Development and Management (647), Grass Waterway (412), Heavy Use Area Protection (561), Livestock Pipeline (516), Stripcropping (585), Subsurface Drainage (606), Terrace (600), Underground Outlet (620), Upland Wildlife Habitat Management (645), Waste Storage Facility (313).

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure including habitat fragmentation for grassland dependent birds. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical area will be a 2.0 acre impaired area. The removal of brush and trees < 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Land Area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $2,456.35

**Scenario Cost/Unit:** $1,228.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 8 | $807.52 |
| Brush Chipper, 6 in. capacity | 938 | Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hours | $32.57 | 8 | $260.56 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 500 - Obstruction Removal

**Scenario** #2 - Removal and Disposal of Brush and Trees > 6 inch Diameter Regional

**Scenario Description:**

Remove and disposal of brush and trees > 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Contour Farming (330), Diversion (362), Early Successional Habitat Development and Management (647), Grass Waterway (412), Heavy Use Area Protection (561), Livestock Pipeline (516), Stripcropping (585), Subsurface Drainage (606), Terrace (600), Underground Outlet (620), Upland Wildlife Habitat Management (645), Waste Storage Facility (313).

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure including habitat fragmentation for grassland dependent birds. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical area will be a 2.0 acre impaired area. The removal of brush and trees > 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Land Area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $5,002.68

**Scenario Cost/Unit:** $2,501.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 12 | $2,220.12 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 12 | $296.40 |
| Brush Chipper, 15 in. capacity | 1868 | Brush Chipper, 15 inch capacity, typically 165 HP. Includes chipper and power unit. Does not include labor. | Hours | $73.99 | 12 | $887.88 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |

**Practice:** 500 - Obstruction Removal

**Scenario** #3 - Brush and Tree Removal with Hand Tools

**Scenario Description:**

Cut brush and trees using hand tools such as a chainsaw. Remove brush and trees using a pick-up truck, chipper or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Contour Farming (330), Diversion (362), Early Successional Habitat Development and Management (647), Grass Waterway (412), Heavy Use Area Protection (561), Livestock Pipeline (516), Stripcropping (585), Subsurface Drainage (606), Terrace (600), Underground Outlet (620), Upland Wildlife Habitat Management (645), Waste Storage Facility (313).

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure including habitat fragmentation for grassland dependent birds. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical area will be a 1.0 acre impaired area. The cutting of brush and trees was performed using hand tools and manual labor. Removal of brush and trees occured using a pick-up truck, chipper or other method. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Land Area

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,132.32

**Scenario Cost/Unit:** $1,132.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 6 | $39.90 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Brush Chipper, 15 in. capacity | 1868 | Brush Chipper, 15 inch capacity, typically 165 HP. Includes chipper and power unit. Does not include labor. | Hours | $73.99 | 6 | $443.94 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |

**Practice:** 500 - Obstruction Removal

**Scenario** #4 - Removal and Disposal of Fence Regional

**Scenario Description:**

Remove and disposal of all existing fences by demolition, excavation or other means required for removal. Dispose of all fence materials from the site so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all materials by removal to an approved landfill, wood chipping and land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of the unwanted fence obstruction in order to apply conservation practices such as Upland Wildlife Habitat Management (645) or facilitate the planned land use. Fence removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment and reduce hazards to wildlife. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Contour Farming (330), Diversion (362), Grass Waterway (412), Heavy Use Area Protection (561), Livestock Pipeline (516), Stripcropping (585), Subsurface Drainage (606), Terrace (600), Underground Outlet (620), Waste Storage Facility (313).

**Before Situation:**

On any land where existing fence interferes with planned land use development, public safety, wildlife movement and habitat, or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical fence will be 2640 in linear feet. The removal of the fence will be performed with the use of equipment and hand labor. Dispose of all debris from the fence removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape such as Upland Wildlife Habitat Management (645).

**Feature Measure:** Length of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,640.00

**Scenario Total Cost:** $3,227.27

**Scenario Cost/Unit:** $1.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 20 | $1,157.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 20 | $494.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 20 | $680.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 500 - Obstruction Removal

**Scenario** #5 - Rock blasting and disposal

**Scenario Description:**

Remove and disposal of rock and or boulders by drilling and blasting for removal. Dispose of all rocks and or boulders so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all rock and or boulders by removal to an approved location, or reuse location. Remove and dispose all rock and or boulders in order to apply conservation practices or facilitate the planned land use. Rocks and or boulders will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and integrity. Associated practices: Waste Storage Facility(313), Grassed waterway (412), Terrace (600), Heavy Use Area Protection (561), Underground outlet (620), Pipeline (516)

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical area will be have rock extending to the surface or within the excavation limits of the practice to be installed. The removal of rock and or boulders will be performed by drilling and blasting required for removal with the use of heavy equipment and hand labor. Typically done on larger projects like waster storage facility where the location must be done in an area with rock formations. Rock is pre-blasted and removed during the excavatoni process. Material un suitable for fill is hauled away and buried or stockpiled for alternate uses. Dispose of all rocks and boulders from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $21,104.14

**Scenario Cost/Unit:** $42.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 48 | $4,536.48 |
| Drilling and Blasting Rock, Bulk | 1395 | Bulk drilling & blasting of rock or boulders not requiring blasting mats (typically a min. 100 CY). Includes all equipment, labor and supplies to complete the blast. | Cubic Yards | $12.57 | 500 | $6,285.00 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $104.49 | 40 | $4,179.60 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 40 | $1,360.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 48 | $2,390.88 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 500 - Obstruction Removal

**Scenario** #6 - Rock, Mechanical Destruction

**Scenario Description:**

Remove and disposal of rock and or boulders by mechanical destruction. Work typically done on projects like waste storage facility or pipelines where rock formations were not anticipated or small in quantity. Requires either a man held jack hammer or track hoe with a rock pecker to break up rock. Rock loaded and or boulders removed with equipment to an approved location, or reuse location. Additional work may include burial of unsuitable materials. This process allows appliction of conservation practices or facilitate the planned land use. Removal address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and integrity. Associated practices: Waste Storage Facility(313), Grassed waterway (412), Terrace (600), Heavy Use Area Protection (561), Underground outlet (620), Pipeline (516)

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The site had 50 CY rock extending above required bottom of excavation or within the excavation limits of the practice to be installed. The removal of rock and or boulders was performed by jack hammering with an equipment mouted rock pecker. Material then removed with heavy equipment and hauled away. Material un suitable for fill is hauled away and buried or stockpiled for alternate uses. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to . The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Volume of rock removed

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $2,566.32

**Scenario Cost/Unit:** $51.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 6 | $750.66 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 6 | $57.66 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 2 | $189.02 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 2 | $210.56 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 500 - Obstruction Removal

**Scenario** #7 - Removal + Disposal of Steel or Concrete Structures < 25 feet high

**Scenario Description:**

Remove and disposal of steel and or concrete structures by demolition, excavation or other means required for removal. Dispose of all steel and or concrete structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all steel and or concrete structures by removal to an approved location, or reuse location. Remove and dispose all steel and or concrete structures in order to apply conservation practices or facilitate the planned land use. Steel and or concrete structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use. Associated Practices: Waste StorageFacility (313), Heavy use area protection (561), Undergrount outlet (620), Struture for water Control (587), Roof Runoff Structure (558), and Critical Area Planting (342)

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

2000 square feet of exiting concrete that isremoved to install and undergound outlet for a Roof Gutter system and establish proper grade for a new Heavy use area. Part of the removal includes 30 feet of 3' high concrete retaining wall. The removal of steel and or concrete structures was performed by demolition and excavation with the use of heavy equipment and hand labor. All steel and or concrete waste from the obstruction was removed so that it does not impede subsequent work or cause onsite or offsite damage.

**Feature Measure:** Land Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $11,078.49

**Scenario Cost/Unit:** $5.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 24 | $2,153.28 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 24 | $230.64 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 24 | $2,268.24 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $104.49 | 24 | $2,507.76 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 48 | $2,390.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 500 - Obstruction Removal

**Scenario** #8 - Removal and Disposal of Wood Structures Regional

**Scenario Description:**

Remove and disposal of wood structures by demolition, excavation or other means required for removal. Wood structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use. Dispose of all wood structures by removal to an approved location, landfill, or reuse location. Materials are sorted for salvage. Wood materials are ground up for mulch.This process allows implementation of additional conservation practices to address a resource concern in that immediate area. Associated Practices: Animal Mortality Facility (316), Composting Facility (317), Contour Farming (330), Diversion (362), Grass Waterway (412), Heavy Use Area Protection (561), Livestock Pipeline (516), Stripcropping (585), Subsurface Drainage (606), Terrace (600), Underground Outlet (620), Waste Storage Facility (313).

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

An existing 32,000 SF poultry facility is removed to allow remidiation of the old dirt floor. Materials are systematically removed and slavaged with none usable material consolidated and landfilled. Wood materials that are suitable are ground up for mulch and stockpiled for remediation work. Work includes hand labor, , grinding, heavy equipment and trucking. The removed facility now allows the existing dirtfloor to be remidiated under a seperate practice.

**Feature Measure:** Building footprint

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 32,000.00

**Scenario Total Cost:** $33,517.28

**Scenario Cost/Unit:** $1.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 64 | $5,742.08 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 64 | $3,702.40 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 64 | $425.60 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $104.49 | 24 | $2,507.76 |
| Tub Grinder, 350 HP | 1404 | TUB grinder-350 HP, 10 feet 6 inch diameter tub opening, 8 ft diameter inside base. Includes equipment cost only. | Hours | $267.74 | 32 | $8,567.68 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 128 | $4,124.16 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 88 | $2,993.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 96 | $4,781.76 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 500 - Obstruction Removal

**Scenario** #23 - Removal + Disposal of Steel or Concrete Structures >= 25 feet high

**Scenario Description:**

Remove and disposal of steel and or concrete structures by demolition, excavation or other means required for removal. Dispose of all steel and or concrete structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all steel and or concrete structures by removal to an approved location, or reuse location. Remove and dispose all steel and or concrete structures in order to apply conservation practices or facilitate the planned land use. Steel and or concrete structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical area will be a 2000 square feet of impaired land. The removal of steel and or concrete structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all steel and or concrete structures from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Land Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $32,927.43

**Scenario Cost/Unit:** $16.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 64 | $11,840.64 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 64 | $5,742.08 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $104.49 | 64 | $6,687.36 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 65 | $3,325.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 65 | $2,094.30 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 65 | $3,237.65 |

**Practice:** 500 - Obstruction Removal

**Scenario** #53 - Removal and disposal of light sand and flood sediment > 30 inches

**Scenario Description:**

Remove and disposal of > 30" of sand and flood deposited sediments by excavation or other means required for removal. Dispose of all sand and flood deposited sediments so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all sand and flood deposited sediments by removal to an approved location, or re-use location. Sand and/or silt removal will only address sand and/or silt obstructing farmland and cropland

**Before Situation:**

On any land where existing obstructions interfere with the return of land to its function prior to the occurrence of a natural disaster. The site may be recreation areas, farms, ranches, or other areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments, aquatic environment does not include land covered by flood waters that have rescinded

**After Situation:**

The typical area will be a 30 acre impaired area. The removal of sand and flood deposited sediments will be performed by excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all sand and flood deposited sediments from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** area covers by sediment greater th

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $151,075.94

**Scenario Cost/Unit:** $5,035.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 173 | $10,008.05 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $104.49 | 693 | $72,411.57 |
| Front End Loader, 130 HP | 1618 | Wheeled front end loader with horsepower range of 110 to 140. Equipment and power unit costs. Labor not included. | Hours | $67.38 | 173 | $11,656.74 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 1109 | $55,239.29 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 7 | $1,760.29 |

**Practice:** 500 - Obstruction Removal

**Scenario** #54 - Removal and disposal of heavy scattered debris

**Scenario Description:**

Removal of a heavy concentration of debris from farmland deposited by natural disaster. Includes the cost of all labor, equipment and disposal from area of debris. Debris is defined as woody material, rock, concrete, trash, and personal property deposited by natural disaster. This disposal shall be in accordance with all applicable Federal, State, and local laws, rules, and regulations. Dispose of all scattered debris so it does not impede farm operations or cause onsite or offsite damage. Dispose of all scattered debris by removal to an approved location, landfill, or reuse location. Scattered debris removal will only address debris obstructing farmland not in the footprint of a structure

**Before Situation:**

On any crop, farm or ranch land where debris from storm damage interfere with planned land use development, public safety or infrastructure. The site is covered with light debris, (wood, trees, metal, and other damage materials). Debris is scattered over a percentage of the field. This is not intended for the removal of obstructions from aquatic environments

**After Situation:**

Scattered debris is removed from a affected area of the field.

**Feature Measure:** Area of debris

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 12,000.00

**Scenario Total Cost:** $16,309.41

**Scenario Cost/Unit:** $1.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 30 | $5,550.30 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 30 | $2,691.60 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 30 | $199.50 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 30 | $3,158.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 30 | $966.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 60 | $2,988.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 500 - Obstruction Removal

**Scenario** #83 - Removal and Disposal of Rock and or Boulders

**Scenario Description:**

Remove and disposal of rock and or boulders by drilling, blasting, demolition, excavation or other means required for removal. Dispose of all rocks and or boulders so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all rock and or boulders by removal to an approved location, or reuse location. Remove and dispose all rock and or boulders in order to apply conservation practices or facilitate the planned land use. Rocks and or boulders will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

**Before Situation:**

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

**After Situation:**

The typical area will be a 5.0 acre impaired area. The removal of rock and or boulders will be performed by drilling, blasting, demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all rocks and boulders from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** Volume

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $78,709.19

**Scenario Cost/Unit:** $157.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 240 | $21,532.80 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $104.49 | 240 | $25,077.60 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 241 | $12,329.56 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 241 | $7,765.02 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 241 | $12,004.21 |

**Practice:** 500 - Obstruction Removal

**Scenario** #115 - Removal and disposal of light sand and flood sediment 12-30 inches

**Scenario Description:**

Remove and disposal of 12" to 30" of sand and flood deposited sediments by excavation or other means required for removal. Dispose of all sand and flood deposited sediments so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all sand and flood deposited sediments by removal to an approved location, or re-use location. Sand and/or silt removal will only address sand and/or silt obstructing farmland and cropland

**Before Situation:**

On any land where existing obstructions interfere with the return of land to its function prior to the occurrence of a natural disaster. The site may be cropland, farms, or ranches affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments, aquatic environment does not include land covered by flood waters that have rescinded

**After Situation:**

The typical area will be a 30 acre impaired area. The removal of sand and flood deposited sediments will be performed by excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all sand and flood deposited sediments from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

**Feature Measure:** area covered by sediment

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $102,089.29

**Scenario Cost/Unit:** $3,402.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 140 | $14,131.60 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 100 | $5,785.00 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $104.49 | 400 | $41,796.00 |
| Front End Loader, 130 HP | 1618 | Wheeled front end loader with horsepower range of 110 to 140. Equipment and power unit costs. Labor not included. | Hours | $67.38 | 100 | $6,738.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 640 | $31,878.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 7 | $1,760.29 |

**Practice:** 500 - Obstruction Removal

**Scenario** #116 - Removal and disposal of light scattered debris

**Scenario Description:**

Removal of debris from farmland deposited by natural disaster. Includes the cost of all labor, equipment and disposal. Debris is defined as woody material, rock, trash, and personal property deposited by natural disaster. This disposal shall be in accordance with all applicable Federal, State, and local laws, rules, and regulations. Dispose of all scattered debris so it does not impede farm operations or cause onsite or offsite damage. Dispose of all scattered debris by removal to an approved location, landfill, or reuse location. Scattered debris removal will only address debris obstructing farmland not in the footprint of a structure

**Before Situation:**

On any crop, farm, or ranch land where debris from storm damage interfere with planned land use development, public safety or infrastructure. The site is covered with light debris, (wood, trees, metal, and other damage materials) on a percentage of the field. This is not intended for the removal of obstructions from aquatic environments

**After Situation:**

Debris is removed from the field and land returned to prior use

**Feature Measure:** Area of debris scatter

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $3,969.34

**Scenario Cost/Unit:** $396.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 10 | $578.50 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 10 | $247.00 |
| Tractor, agricultural, 160 HP | 1203 | Agricultural tractor with horsepower range of 140 to 190. Equipment and power unit costs. Labor not included. | Hours | $87.50 | 10 | $875.00 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.09 | 10 | $100.90 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 30 | $1,020.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 511 - Forage Harvest Management

**Scenario** #1 - Improved Forage Quality

**Scenario Description:**

Improved cultural practices and recordkeeping result in better forage quality and better livestock performance. Associated Practices: Conservation Crop Rotation (328), Forage and Biomass Planting (512), Integrated Pest Management (595), Nutrient Management (590), and Prescribed Grazing (528).

**Before Situation:**

Forage cutting heights are as close to the ground as equipment will allow resulting in very low stubble height. Plant regrowth is very slow. Forage quality tests are not regularly done. Records of forage quality components, cutting heights, moisture content, and harvest schedule are not regularly kept.

**After Situation:**

Forage cutting heights are raised to leave at least 3-4" stubble height for cool season grasses and 6-8" for warm season grasses. Increased residual forage results in much faster plant regrowth. Forage quality tests are submitted to an accredited lab for analysis. Records of forage quality components, cutting heights, moisture content, and harvest schedule are regularly kept to track increased forage quality and improved livestock performance.

**Feature Measure:** Improved Relative Feed Value

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $473.05

**Scenario Cost/Unit:** $15.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 2 | $49.00 |

**Practice:** 511 - Forage Harvest Management

**Scenario** #2 - Organic Preemptive Harvest

**Scenario Description:**

Preemptive harvest of forage crops to prevent damage from insects (such as leafhopper on alfalfa) or other pests results in better forage quality and better livestock performance. Associated Practices: Conservation Crop Rotation (328), Forage and Biomass Planting (512), Integrated Pest Management (595), Nutrient Management (590), and Prescribed Grazing (528).

**Before Situation:**

Forage pests are usually controlled with pesticides.

**After Situation:**

In organic or transitioning to organic systems, forage pests are controlled by executing a preemptive harvest before pests can damage forage quality. Forage yields are reduced because of immature stage of forage growth. Forage tests are submitted to an accredited lab for analysis. Records of forage quality components are used to adjust feeding rations.

**Feature Measure:** Relative Feed Value Maintained

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $473.05

**Scenario Cost/Unit:** $15.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 2 | $49.00 |

**Practice:** 511 - Forage Harvest Management

**Scenario** #3 - Perennial Crops - Delayed Mowing

**Scenario Description:**

In perennial forage crops, the delaying the harvest of the first cutting to promote the reproduction of ground nesting birds. Delaying the harvest of the first cutting will benefit ground nesting birds; research at the University of Vermont showed that breeding success for declining grassland songbirds (e.g. Bobolink) went from 0 on a regularly harvested hay field to 2.8 fledglings per female per year when the the first harvest on a hayfield was delayed until August 1st. Bobolinks, Eastern Meadowlarks, and Savannah Sparrows require a nesting period to fledge young that lasts through the end of July in most parts of the eastern US. The delayed harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), making the forage crop less palatable and lower in relative feed value. The selected fields should be large enough to promote ground nesting birds. After young have fledged the field will be harvested for dry forages. Associated Practices: Conservation Crop Rotation (328), Forage and Biomass Planting (512), Integrated Pest Management (595), Nutrient Management (590), Prescribed Grazing (528), Upland Wildlife Habitat Management (645).

**Before Situation:**

Perennial forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

**After Situation:**

Annual crops are harvested with a delayed mowing; forage quality is compromised, however, the survival of ground nesting birds is promoted.

**Feature Measure:** Increased grassland bird populatio

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $2,500.79

**Scenario Cost/Unit:** $125.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $50.94 | 45 | $2,292.30 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 2 | $49.00 |

**Practice:** 511 - Forage Harvest Management

**Scenario** #4 - Double cropping Annuals - Delayed harvest and subsequent planting

**Scenario Description:**

In doublecropped annual forages, delaying the harvest of the first crop will provide feed and shelter for ground nesting birds. Delaying the harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), making the forage crop less palatable and lower in relative feed value. The selected fields should be large enough to promote ground nesting birds. After the young have fledged the second crop will be planted, approximately one month later than normal. Subsequently, the harvest of the second crop will cause an approximately 20% yield decline. The selected area should be large enough to buffer adults and nestlings from silage chopping in adjacent areas or fields. After young have fledged the field will be chopped and used as grain or silage. This practice is best planned cooperatively with the farmer and appropriate wildlife agencies far enough in advance to reduce disturbance to ground nesting birds. For example, Tricolored Blackbirds need a 35-day window from the time of nest building to fledge young and the silage needs to remain uncut until then. Associated Practices: Conservation Crop Rotation (328), Forage and Biomass Planting (512), Integrated Pest Management (595), Nutrient Management (590), Prescribed Grazing (528), Upland Wildlife Habitat Management (645).

**Before Situation:**

Double cropped annual forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

**After Situation:**

Double cropped annual crops are harvested with a delayed mowing and a subesquent later planting of the second crop; forage quality is compromised somewhat, however, the survival of ground nesting birds is promoted.

**Feature Measure:** Increased grassland bird populatio

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $1,813.10

**Scenario Cost/Unit:** $60.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $50.94 | 31.5 | $1,604.61 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 2 | $49.00 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #1 - Native Perennial Grasses (1 species)

**Scenario Description:**

Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

**Before Situation:**

Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

**After Situation:**

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $14,735.90

**Scenario Cost/Unit:** $491.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 30 | $396.30 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 30 | $181.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 30 | $217.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 30 | $668.10 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 1500 | $1,515.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 1500 | $885.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 60 | $6,549.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 30 | $500.40 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 30 | $3,807.30 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #2 - Introduced Cool Season Grass Mix

**Scenario Description:**

Establish or reseed adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

**Before Situation:**

Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

**After Situation:**

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $13,780.10

**Scenario Cost/Unit:** $459.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 30 | $396.30 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 30 | $181.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 30 | $217.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 30 | $668.10 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 1200 | $1,488.00 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 1500 | $1,515.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 1500 | $885.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 60 | $6,549.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 30 | $500.40 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 30 | $1,363.50 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #3 - Native Perennial Warm Season Grasses Mix

**Scenario Description:**

Establish or reseed a mix of species of adapted native, perennial warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

**Before Situation:**

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

**After Situation:**

Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $14,735.90

**Scenario Cost/Unit:** $491.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 30 | $396.30 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 30 | $181.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 30 | $217.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 30 | $668.10 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 1500 | $1,515.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 1500 | $885.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 60 | $6,549.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 30 | $500.40 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 30 | $3,807.30 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #4 - Sprigging

**Scenario Description:**

Sprigging new grasses with sprigging application for the purpose of providing forage, increasing plant diversity, soil quality and fertility, and plant health. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, sprigs, equipment and labor for seed bed prep, tillage, sprigging ,and spreading. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

**Before Situation:**

Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

**After Situation:**

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $16,674.20

**Scenario Cost/Unit:** $555.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 30 | $396.30 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 30 | $181.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 30 | $217.80 |
| Ground sprigging | 1101 | Includes costs for equipment, power unit and labor. | Acres | $71.71 | 30 | $2,151.30 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 1200 | $1,488.00 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 1500 | $1,515.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 1500 | $885.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 60 | $6,549.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 30 | $500.40 |
| Perennial Grass Sprigs or Rhizomes, acre | 2323 | Perennial grasses used across a large area using vegetative propagules including sprigs or rhizomes. Includes materials and shipping. | Acres | $92.48 | 30 | $2,774.40 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #5 - Organic Introduced Perennial Cool Season Grasses with legume

**Scenario Description:**

This practice applies to organically managed pasture or hayland. Establish or reseed three species of adapted perennial introduced cool season grasses and legume to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Producer follows all National Organic Program (NOP) rules and regulations. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

**Before Situation:**

Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

**After Situation:**

NOP approved species, materials, and methods are utilized to establish pasture or hayland, to improve forage quality and quantity, and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $3,664.30

**Scenario Cost/Unit:** $366.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| **Materials** | | | | | | |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Nitrogen, Organic | 266 | ORGANIC Nitrogen | Pound | $0.23 | 400 | $92.00 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.08 | 500 | $40.00 |
| Potassium, Organic | 268 | ORGANIC Potassium | Pound | $0.15 | 500 | $75.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Certified Organic, Perennial Grasses, Legumes and/or Forbs | 2340 | Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only. | Acres | $83.14 | 10 | $831.40 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #6 - Untreated Conventional Seed, WSG, 1 species

**Scenario Description:**

This practice applies to organically managed pasture and hayland. Establish or reseed adapted perennial native grasses (1 species) to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Producer follows all National Organic Program (NOP) rules and regulations. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

**Before Situation:**

Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

**After Situation:**

NOP approved species, materials, and methods are utilized to establish pasture or hayland, to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $3,877.90

**Scenario Cost/Unit:** $387.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| **Materials** | | | | | | |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.08 | 500 | $40.00 |
| Potassium, Organic | 268 | ORGANIC Potassium | Pound | $0.15 | 500 | $75.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 10 | $1,269.10 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #7 - Untreated Conventional Seed, WSG Mix

**Scenario Description:**

This practice applies to organically managed pasture and hayland. Establish or reseed adapted perennial native grasses (3 species) to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading. Producer follows all National Organic Program (NOP) rules and regulations. Associated Practices: Fence (382), Forage Harvest Management (511), and Watering Facility (614).

**Before Situation:**

Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

**After Situation:**

NOP approved species, materials, and methods are utilized to establish pasture or hayland, to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $3,877.90

**Scenario Cost/Unit:** $387.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| **Materials** | | | | | | |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 20 | $2,183.00 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.08 | 500 | $40.00 |
| Potassium, Organic | 268 | ORGANIC Potassium | Pound | $0.15 | 500 | $75.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 10 | $1,269.10 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #8 - Overseeding with Nutrient Application

**Scenario Description:**

An existing pasture is spring overseeded to desirable species of introduced forage species to improve forage quality and quantiy, and reduce soil erosion. Nutrient application is needed as per the soil test to ensure a viable stand.

**Before Situation:**

A poorly managed/degraded pastureland is comprised of 60% to 80% of desirable species. The existing stand is not suitable for a proper grazing management system.

**After Situation:**

A seed mixture of introduced forage species is overseeded into an existing pasture. Suitable species are established to improve forage quality and quantity and reduce soil erosion on hayland, pasture, and/or biomass production.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $11,883.95

**Scenario Cost/Unit:** $396.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 30 | $181.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 30 | $217.80 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 30 | $356.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 30 | $668.10 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 1200 | $1,488.00 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 1500 | $1,515.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 1500 | $885.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 45 | $4,911.75 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 30 | $500.40 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #9 - Organic, Overseeding with nutrients

**Scenario Description:**

An existing organic pasture is spring overseeded to desirable species of introduced forage species to improve forage quality and quantiy, and reduce soil erosion. No additional nutrient application is needed as per the soil test to ensure a viable stand.

**Before Situation:**

A poorly managed/degraded pastureland is comprised of 60% to 80% of desirable species. The existing stand is not suitable for a proper grazing management system.

**After Situation:**

A seed mixture of introduced forage species is overseeded into an existing pasture. Suitable species are established to improve forage quality and quantity and reduce soil erosion on hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $653.90

**Scenario Cost/Unit:** $65.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Certified Organic, Perennial Grasses, Legumes and/or Forbs | 2340 | Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only. | Acres | $83.14 | 5 | $415.70 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #51 - Overseeding, no inputs

**Scenario Description:**

An existing conventional or organic pasture is spring overseeded to desirable species of introduced forage species to improve forage quality and quantiy, and reduce soil erosion. No additional nutrient application is needed as per the soil test to ensure a viable stand.

**Before Situation:**

A poorly managed/degraded pastureland is comprised of 60% to 80% of desirable species. The existing stand is not suitable for a proper grazing management system.

**After Situation:**

A seed mixture of introduced forage species is overseeded into an existing pasture. Suitable species are established to improve forage quality and quantity and reduce soil erosion on hayland, pasture, and/or biomass production.

**Feature Measure:** Acres of Forgage and Biomass Plan

**Scenario Unit:** Acres

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $2,510.30

**Scenario Cost/Unit:** $83.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 30 | $181.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 30 | $668.10 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 30 | $500.40 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** 512 - Pasture and Hay Planting

**Scenario** #71 - Small farm, Pasture and Hay planting for 1 ac.

**Scenario Description:**

Establish or reseed adapted perennial introduced grasses to improve or maintain livestock nutrition and health and promote soil cover to reduce erosion. This scenario assumes hand labor for aerial broadcast of seed and tillage of soil.

**Before Situation:**

Poorly managed/degraded pasture land or other land uses being converted to pasture within a small farm area.

**After Situation:**

Suitable species are established to improve forage quality and quantity, and reduce soil erosion on pasture within a snalll farm area.

**Feature Measure:** acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $804.26

**Scenario Cost/Unit:** $804.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 1 | $12.27 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2748 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $64.94 | 1 | $64.94 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #1 - 2 inches or less buried by LF

**Scenario Description:**

Buried pipeline is installed using PE or equivalent pipe. Pipe size is 2 inches or less and site soils allow for normal excavation. (I.e., soils are not clayey and depth of soil is adequate for burying pipeline to a frost-free depth.) Construct 1000 feet of 1.5 -inch, Schedule 40, PVC Pipeline with appurtenances. The scenario unit is linear feet of pipe. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Fence (382), Prescribed Grazing (528), Pumping Plant (533), Spring Development (574), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Linear foot of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $3,662.92

**Scenario Cost/Unit:** $3.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Pipeline Plowing | 1096 | Includes equipment and labor for plowing small diameter lines in common earth (< 3 inch) | Feet | $1.16 | 1000 | $1,160.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 9 | $289.98 |
| **Materials** | | | | | | |
| Pipe, PVC, 1 1/2 in., SCH 40 | 975 | Materials: - 1 1/2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.71 | 1000 | $1,710.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #2 - Over 2 inches, buried by LF

**Scenario Description:**

Buried pipeline is installed using PE or equivalent pipe. Pipe size is over 2 inches in diameter and site soils allow for normal excavation. (I.e., soils are not clayey and depth of soil is adequate for burying pipeline to a frost-free depth.) Construct 1000 feet of 4 -inch, Schedule 40, PVC Pipeline with appurtenances. The scenario unit is linear feet of pipe. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Fence (382), Prescribed Grazing (528), Pumping Plant (533), Spring Development (574), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Linear feet of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $8,835.14

**Scenario Cost/Unit:** $8.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 1000 | $1,530.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 9 | $289.98 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 2178 | $6,512.22 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #3 - 2 inches or less on surface by LF

**Scenario Description:**

Surface pipeline is installed using PE or equivalent pipe. Pipe size is 2 inches or less. Construct 1000 feet of 1.5 -inch, PE Pipeline with appurtenances. The scenario unit is linear feet of pipe. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Fence (382), Prescribed Grazing (528), Pumping Plant (533), Spring Development (574), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Linear foot of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $1,897.76

**Scenario Cost/Unit:** $1.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Pipe, PE, 1 1/4 in., DR 9 | 998 | Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $1.64 | 1000 | $1,640.00 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #4 - Boring, Pipeline, All sizes

**Scenario Description:**

Pipeline is bored under road or stream using seamless pipe that meets or exceeds main pipeline size and pressure rating. Site location does not allow for open trench. (I.e., No permit can be obtained for open trench on road crossing and/or digging open trench across stream) Bore 100 feet of 4 -inch, Pipeline. Appurtenances include: couplings and fittings to connect to planned pipeline and are included in the cost of pipe material (additional 10% of pipe material quantity). The scenario unit is linear feet of bored pipe from coupler to coupler. Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Fence (382), Prescribed Grazing (528), Pumping Plant (533), Spring Development (574), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Linear feet of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $15,415.86

**Scenario Cost/Unit:** $154.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Horizontal Boring, Greater Than 3 in. diameter | 1132 | Includes equipment, labor and setup. | Feet | $126.18 | 100 | $12,618.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Pipe, PE, 4 in., DR 9 | 1002 | Materials: - 4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $12.13 | 100 | $1,213.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #90 - HDPE (Iron Pipe Size and Tubing), Small Scale

**Scenario Description:**

Below ground installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb/ft, or a total of 42 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 42.00

**Scenario Total Cost:** $1,810.84

**Scenario Cost/Unit:** $43.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 260 | $397.80 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 8 | $190.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 46 | $203.78 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #91 - Surface HDPE (Iron Pipe Size and Tubing), Small Scale

**Scenario Description:**

On-ground surface installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb/ft, or a total of 42 pounds. Appurtenances include fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 42.00

**Scenario Total Cost:** $662.34

**Scenario Cost/Unit:** $15.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 8 | $190.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 46 | $203.78 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #126 - PVC (Iron Pipe Size)

**Scenario Description:**

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, PVC pipe weighs 0.501 lb/ft, or a total of 2,645 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 2,645.00

**Scenario Total Cost:** $18,828.80

**Scenario Cost/Unit:** $7.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 5280 | $8,078.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 2910 | $8,700.90 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #127 - HDPE (Iron Pipe Size & Tubing)

**Scenario Description:**

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 2,508.00

**Scenario Total Cost:** $20,071.95

**Scenario Cost/Unit:** $8.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Pipeline Plowing | 1096 | Includes equipment and labor for plowing small diameter lines in common earth (< 3 inch) | Feet | $1.16 | 5280 | $6,124.80 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 8 | $190.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 2759 | $12,222.37 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #128 - Surface HDPE (Iron Pipe Size & Tubing)

**Scenario Description:**

Description: on-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 2,508.00

**Scenario Total Cost:** $14,136.84

**Scenario Cost/Unit:** $5.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hours | $23.85 | 8 | $190.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $4.43 | 2884 | $12,776.12 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #129 - Steel (Iron Pipe Size)

**Scenario Description:**

Description: Below ground installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 14,351.00

**Scenario Total Cost:** $53,159.60

**Scenario Cost/Unit:** $3.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 5280 | $8,078.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 144 | $4,639.68 |
| **Materials** | | | | | | |
| Pipe, steel, smooth wall, galvanized, weight priced | 1381 | Steel manufactured into galvanized smooth wall pipe | Pound | $2.53 | 15786 | $39,938.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #130 - Surface Steel (Iron Pipe Size)

**Scenario Description:**

Description: on-ground surface installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, expansion joints, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

**Before Situation:**

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

**After Situation:**

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

**Feature Measure:** Weight of Pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 14,351.00

**Scenario Total Cost:** $46,394.80

**Scenario Cost/Unit:** $3.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 144 | $4,639.68 |
| **Materials** | | | | | | |
| Pipe, steel, smooth wall, galvanized, weight priced | 1381 | Steel manufactured into galvanized smooth wall pipe | Pound | $2.53 | 16504 | $41,755.12 |

**Practice:** 516 - Livestock Pipeline

**Scenario** #137 - Rural Water Connection Equipment

**Scenario Description:**

The rural water connection includes the 4' manhole, meter, 500' of pipe, valves, and necessary installation for connecting from a rural water pipeline to a livestock distribution pipeline. This item includes installation, all materials, appurtenances, and labor required to construct and install the meter pit. This item does not include the hook-up fees to the rural water system. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636), Spring Development (574), and Prescribed Grazing (528).

**Before Situation:**

Inadequate water supply for domestic animals located on grazed range, pasture, or grazed forest in the northern plains region.

**After Situation:**

A rural water connection which provides access to a reliable, high quality water supply for meeting the needs of domestic animals on grazed range, pasture, or grazed forest in the northern plains region. The 4' manhole, meter, pipe and appurtenances will enable the pipeline to meet the quantity requirements of domestic animals.

**Feature Measure:** Rural Water Connection

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,630.90

**Scenario Cost/Unit:** $4,630.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| Trencher, 8 in. | 936 | Equipment and power unit costs. Labor not included. | Hours | $49.64 | 6 | $297.84 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| **Materials** | | | | | | |
| Freeze Proof Hydrant, <= 3 ft. | 240 | Freeze Proof Hydrant, 3 foot or less bury. Materials only. | Each | $63.70 | 1 | $63.70 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 600 | $1,350.00 |
| Manhole, 4 ft x 4 ft | 1053 | Precast Manhole with base and top delivered. 4 feet diameter x 4 feet. Includes materials only. | Each | $1,476.74 | 1 | $1,476.74 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario** #52 - Soil Dispersant - Uncovered

**Scenario Description:**

Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions and compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,613.00

**Scenario Total Cost:** $11,335.16

**Scenario Cost/Unit:** $7.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1613 | $6,790.73 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 6 | $379.98 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Soil Dispersant | 1490 | Soil Amendment (tetrasodium pyrophosphate (TSPP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent) | Ton | $451.33 | 6.53 | $2,947.18 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario** #53 - Soil Dispersant - Covered

**Scenario Description:**

Construction of a compacted soil liner, treated with a soil dispersant, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the dispersant with the soil liner under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material including

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,226.00

**Scenario Total Cost:** $18,125.89

**Scenario Cost/Unit:** $5.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 3226 | $13,581.46 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 6 | $379.98 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Soil Dispersant | 1490 | Soil Amendment (tetrasodium pyrophosphate (TSPP), sodium tripolyphosphate (STPP), or soda ash or approved equivalent) | Ton | $451.33 | 6.53 | $2,947.18 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario** #54 - Bentonite Treatment - Uncovered

**Scenario Description:**

Construction of a compacted soil liner, treated with bentonite, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with dispersants.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,613.00

**Scenario Total Cost:** $188,183.06

**Scenario Cost/Unit:** $116.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1613 | $6,790.73 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 6 | $379.98 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 7 | $238.14 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $34.44 | 5227 | $180,017.88 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario** #55 - Bentonite Treatment - Covered

**Scenario Description:**

Construction of a compacted soil liner, treated with bentonite, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes incorporation of the bentonite with the soil under proper moisture conditions, compaction to the designed liner thickness, and placement of soil cover over the treated liner. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practice PS378, PS313.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. Soils are suitable for treatment with bentonite.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material (includes

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 3,227.00

**Scenario Total Cost:** $194,978.00

**Scenario Cost/Unit:** $60.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 3227 | $13,585.67 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 6 | $379.98 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 7 | $238.14 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $34.44 | 5227 | $180,017.88 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 1 | $1.00 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario** #56 - Material haul < 1 mile

**Scenario Description:**

Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul < 1 mile. Associated practices include PS378, PS313, & other waste water impoundments.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an econical haul distance. Material haul < 1 mile.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material (including

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,420.00

**Scenario Total Cost:** $26,742.75

**Scenario Cost/Unit:** $11.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2420 | $10,188.20 |
| Excavation, clay, large equipment, 1500 ft | 1217 | Bulk excavation of clay with scrapers with average haul distance of 1500 feet. Includes equipment and labor. | Cubic Yards | $6.14 | 1613 | $9,903.82 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 807 | $3,106.95 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 14 | $1,851.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 520 - Pond Sealing or Lining, Compacted Soil Treatment

**Scenario** #57 - Material haul > 1 mile

**Scenario Description:**

Construction of a compacted soil liner, treated with compacted clay, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and protection of the finished liner. Material haul > 1 mile. Associated practices include PS378, PS313, & other waste water impoundments.

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance.

**After Situation:**

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material (including

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,420.00

**Scenario Total Cost:** $32,693.85

**Scenario Cost/Unit:** $13.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2420 | $10,188.20 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 20 | $1,890.20 |
| Excavation, clay, large equipment, 1500 ft | 1217 | Bulk excavation of clay with scrapers with average haul distance of 1500 feet. Includes equipment and labor. | Cubic Yards | $6.14 | 1613 | $9,903.82 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 807 | $3,106.95 |
| Hauling, bulk, highway truck | 1615 | Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck. | Cubic Yard Mile | $0.38 | 8065 | $3,064.70 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 20 | $996.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 14 | $1,851.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

**Scenario** #1 - Flexible Liner with leak detection line

**Scenario Description:**

A flexible, geosynthetic membrane liner is installed to prevent seepage from waste storage impoundment structures. A leak detection line, geotextile to cushion liner from subgrade damage, and a liner with vents anchored around the top of an earthen pond are installed. Associated practices include Pond (378), Waste Storage Facility(313), Heavy Use Area Protection (561), Critical Area Planting (342), Access Road (560) Waste Transfer (634) Underground Ground Outlet (620) and Fence (382)

**Before Situation:**

Soils on-site exhibit seepage rates in excess of acceptable limits. If not lined, soils will allow the passage of nutrients and pathogens from the waste storage facility or pond negatively impacting water quality.

**After Situation:**

A 60mil, HPDE flexible liner is installed after a leak detection line is placed. The entire area is covered with geotextile. The measurement is based on the neatline of square feet of material installed to inside top slope. Environmental protection is provided by avoiding seepage losses from waste storage impoundments.

**Feature Measure:** Surface area of Liner Material (To I

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 21,700.00

**Scenario Total Cost:** $40,232.81

**Scenario Cost/Unit:** $1.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 2420 | $3,436.40 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 8 | $717.76 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 32 | $1,851.20 |
| Roller, vibratory, towed | 1330 | Towed vibratory smooth or tamping foot (sheepsfoot) roller compactor typically 25 ton. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer. | Hours | $91.65 | 4 | $366.60 |
| Front End Loader, 185 HP | 1619 | Wheeled front end loader with horsepower range of 160 to 210. Equipment and power unit costs. Labor not included. | Hours | $104.89 | 4 | $419.56 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 40 | $1,360.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 64 | $8,465.92 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 45 | $1,366.20 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 300 | $1,989.00 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 2420 | $17,641.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

**Scenario** #2 - Flexible liner used for Agrichemical Mixing Facility

**Scenario Description:**

A flexible, geosynthetic membrane liner is installed to prevent seepage from an agricultural chemical handling facility. Geotextile is installed on entire area to cushion liner from subgrade damage. The liner is anchored with vents. Associated practices include Pond (378),Heavy Use Area Protection (561), Critical Area Planting (342), Access Road (560), Underground Ground Outlet (620), and Fence (382)

**Before Situation:**

Soils on-site exhibit seepage rates in excess of acceptable limits. If not lined, soils will allow the passage of nutrients and pathogens from the waste storage facility or pond negatively impacting water quality.

**After Situation:**

A flexible liner suitable for chemicals or pesticides is installed over geotextile. The measurement is based on the neatline of square foot of material installed to inside top of slope. Environmental protection is provided by avoiding seepage losses from spillage within facility designed to contain spillage.

**Feature Measure:** SF of liner to inside top

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $6,734.55

**Scenario Cost/Unit:** $2.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 102 | $144.84 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 4 | $358.88 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 16 | $925.60 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 2 | $41.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 18 | $612.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 16 | $2,116.48 |
| **Materials** | | | | | | |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 102 | $743.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 522 - Pond Sealing or Lining - Concrete

**Scenario** #10 - Concrete liner, non-reinforced

**Scenario Description:**

Construction of a non-reinforced concrete liner to reduce seepage losses from ponds or waste storage impoundment structures. A non-reinforced concrete liner is intended to be used where liquid tightness is not required. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated Practices: Pond (378), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits and construction of a compacted soil liner is not feasible with available soils.

**After Situation:**

Water conservation and environmental protection provided by reducing seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Concrete liner

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 278.00

**Scenario Total Cost:** $76,435.99

**Scenario Cost/Unit:** $274.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 278 | $59,447.52 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 278 | $1,170.38 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 10 | $1,492.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 278 | $8,440.08 |
| Property/Safety Signs | 293 | Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only. | Each | $2.02 | 2 | $4.04 |
| Structural steel tubing, 2 in. diameter | 1120 | Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only | Feet | $5.64 | 15 | $84.60 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 566 | $5,416.62 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 522 - Pond Sealing or Lining - Concrete

**Scenario** #11 - Concrete liner, reinforced

**Scenario Description:**

Construction of a reinforced concrete liner to reduce seepage losses from ponds or waste storage impoundment structures. A reinforced concrete liner is intended to be used where liquid tightness is required. Practice implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated Practices: Pond (378), Waste Storage Facility (313), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

**Before Situation:**

In-place soils at site exhibit seepage rates in excess of acceptable limits and construction of a compacted soil liner is not feasible with available soils.

**After Situation:**

Water conservation and environmental protection provided by reducing seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Concrete Liner

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 347.00

**Scenario Total Cost:** $160,181.55

**Scenario Cost/Unit:** $461.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 347 | $142,894.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 278 | $1,170.38 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 12 | $1,790.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 278 | $8,440.08 |
| Property/Safety Signs | 293 | Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only. | Each | $2.02 | 2 | $4.04 |
| Structural steel tubing, 2 in. diameter | 1120 | Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only | Feet | $5.64 | 15 | $84.60 |
| Waterstop, PVC, ribbed, 3/16 in x 6 in | 1614 | Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor. | Feet | $9.57 | 566 | $5,416.62 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 527 - Sinkhole Treatment

**Scenario** #1 - Linear Opening

**Scenario Description:**

Installing a sinkhole protection cap on a sinkhole with a linear opening. The area around a sinkhole may be unstable and slippage or subsidence may occur. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Sinkholes are routinely used for waste pits by landowners. Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

**Before Situation:**

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Trash & Debris have accumulated in the sinkhole from years of use as a waste pit. 'Typical Sinkhole treated is 25' length and 10' top width, depth varies

**After Situation:**

Debris removed and properly disposed of off site. The sinkhole protection cap installation resolves the safety issue for people, livestock, & wildlife. The open crevice is filled with porous material so as not to disrupt the hydrology of the karst system while filtering runoff. Typical Sinkhole treated is 25' length and 10' top width, depth varies.

**Feature Measure:** LF of opening

**Scenario Unit:** Feet

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $10,603.93

**Scenario Cost/Unit:** $424.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 6 | $3,241.80 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 80 | $113.60 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 95 | $243.20 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 50 | $181.50 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 30 | $934.50 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 15 | $793.65 |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $107.37 | 10 | $1,073.70 |
| Pipe, PVC, Schedule 80, Perforated | 1408 | Materials: 12 inch Diameter schedule 80 perforated pvc pipe - ASTM D1785 | Feet | $74.88 | 20 | $1,497.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 527 - Sinkhole Treatment

**Scenario** #2 - Reverse Filter, CY

**Scenario Description:**

Closing a cone-shaped sinkhole with stone, gravel and soil from offsite sources in order to maintain existing hydrology. The area around a sinkhole is unstable and slippage or subsidence may occur. Sinkholes present safety hazards to people, equipment and/or livestock. Sinkholes are direct conduits to groundwater, nutrient or chemical laden runoff that enters a sinkhole will pollute groundwater. Sinkholes have routinely been used as waste disposal sites. The sinkhole area and depth is easy to measure to estimate the volume of work to be done. Associated practices: Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) Diversion (362).

**Before Situation:**

An open sinkhole exists in an agricultural setting. Open sinkhole poses a risk to people, equipment, livestock, & wildlife. The sinkhole has been used as a waste disposal site and is full of solid waste and debris. Polluted runoff flows into the open sinkhole untreated. Typical Sinkhole treated is cone-shaped, with a 30' Diameter opening & 8' depth.

**After Situation:**

Solid waste, if present, is addressed under associated practice Obstruction Removal (500). Organic debris and soil are excavated and utilized or disposed on-site. The sinkhole closure consists of locating the throat, plugging the throat, and placing layers of graded aggregate. A few boulders are placed to bridge the throat, followed by layers of progressively smaller material from rip-rap to sand. Porous material is used to filter runoff and maintain the hydrology of the karst system. Geotextile spans the opening to separate material and distribute loads. Native soil is spread and graded to blend with original ground. A buffer may be established around the sinkhole through associated practice Critical area planting (342).

**Feature Measure:** CY of sinkhole

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 75.00

**Scenario Total Cost:** $9,459.74

**Scenario Cost/Unit:** $126.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 220 | $312.40 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 75 | $192.00 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 110 | $399.30 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 16 | $1,175.84 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 16 | $2,128.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 32 | $1,593.92 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 38 | $1,183.70 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 18 | $952.38 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 527 - Sinkhole Treatment

**Scenario** #3 - Reverse Filter, SF

**Scenario Description:**

Installing a sinkhole protection cap on a sinkhole with a vertical opening. The area around a sinkhole may be unstable and slippage or subsidence may occur. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Sinkholes are routinely used for waste pits by landowners. The sinkhole surface area is easily determined, but the depth is not defined making a volume determination difficult, therefore use the surface area as the payment unit. This option to solve situation includes removing any debris, removing unconsolidated soil down to bedrock, installing geotextile, large rock and progressively smaller rock, wrap with geotextile to make a reverse filter and capping with impervious material if site is not a low area. Naturally low areas will be finished to allow perculation without causing fines to move out with associated practice, Vertical Drain. Associated Practices: Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

**Before Situation:**

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Trash & Debris have accumulated in the sinkhole from years of use as a waste pit. Typical Sinkhole treated is 30' Dia & 8' depth

**After Situation:**

Debris removed and properly disposed of off site. The 30' diameter by 8' deep sinkhole was then excavated and layers of geotextile and stone placed to establish a reverse filter and then topped with a protective cap of soil to resolve the safety issue for people, livestock, & wildlife. SItes with sinkholes in low areas will need a vertical drain too allow drainage and planned as a seperate practice.

**Feature Measure:** Surface area of sinkhole

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 706.00

**Scenario Total Cost:** $7,316.44

**Scenario Cost/Unit:** $10.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 220 | $312.40 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 70 | $254.10 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 52 | $1,619.80 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 36 | $1,904.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 527 - Sinkhole Treatment

**Scenario** #4 - Circular Opening, Grouted

**Scenario Description:**

Closing a cylindrical sinkhole with grout to exclude runoff from system. The area around a sinkhole is unstable and slippage or subsidence may occur. Sinkholes present safety hazards to people, equipment and/or livestock. Sinkholes are direct conduits to groundwater, nutrient or chemical laden runoff that enters a sinkhole will pollute groundwater. Associated practices: Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) Diversion (362).

**Before Situation:**

An open sinkhole exists in an agricultural setting. Open sinkhole poses a risk to people, equipment, livestock, & wildlife. The sinkhole has recently developed following a storm event. Polluted runoff flows into the open sinkhole untreated. Typical sinkhole treated is cylindrical, with a 5' diameter and 20' depth.

**After Situation:**

In this setting it is critical to disconnect the surface hydrology from the karst hydrology. Organic debris and soil are excavated and utilized or disposed on-site. The sinkhole closure consists of locating the throat, plugging the throat, and pumping grout to fill the void. A few boulders are placed to bridge the throat. Grout / flowable fill is pumped into the void until refusal. Native soil is spread and mounded over the sinkhole area to shed runoff.

**Feature Measure:** CY of sinkhole

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $11,246.00

**Scenario Cost/Unit:** $749.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 14 | $7,564.20 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 7 | $17.92 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 528 - Prescribed Grazing

**Scenario** #1 - Pasture Standard, Paddock Residency 3 or more days

**Scenario Description:**

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex:photo points, stubble height after grazing, etc) & record keeping. Associated Practices: Brush Management (314), Herbaceous Weed Control (315), Pond (378), Fence (382), Acess Control (472), Forage and Biomass Planting (512), Pipeline (516), Spring Development (574), Animal Trails and Walkways (575), Stream Crossing (578), Nutrient Management (590), Feed Management (592), Watering Facility (614), Water Well (642).

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through protection of sensitive areas, and efficient harvest of forage resources. Grazing system success will be evaluated through short term monitoring.

**Feature Measure:** Area of grazed pasture

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $1,777.40

**Scenario Cost/Unit:** $44.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 14 | $716.24 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 28 | $902.16 |

**Practice:** 528 - Prescribed Grazing

**Scenario** #2 - Pasture Intensive - Paddock Residency less than 3 days

**Scenario Description:**

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex: trend, composition, production, etc), record keeping. Associated Practices: Brush Management (314), Herbaceous Weed Control (315) Pond (378), Fence (382), Acess Control (472), Forage and Biomass Planting (512), Pipeline (516), Spring Development (574), Animal Trails and Walkways (575), Stream Crossing (578), Nutrient Management (590), Feed Management (592), Watering Facility (614), Water Well (642).

**Before Situation:**

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

**After Situation:**

Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through proper rest and recovery periods, protection of sensitive areas, proper utilization, and efficient harvest of forage resources. Grazing system success will be evaluated through long term monitoring.

**Feature Measure:** Area of grazed pasture

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $3,083.30

**Scenario Cost/Unit:** $77.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 18 | $333.90 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 45 | $1,449.90 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Nutritional Balance Analyzer, fecal sample analysis only | 1127 | NIRS fecal analysis, animal performance report. Includes materials and shipping only. | Each | $47.39 | 6 | $284.34 |

**Practice:** 528 - Prescribed Grazing

**Scenario** #3 - Pasture Deferment of Interrupted Harvest

**Scenario Description:**

Defer the pasture for 90 days and up to a growing season to manage for invasive weeds when necessary, to improve the health of the plants and/or provide nesting habitat for wildlife species. Keep records of dates out and monitor to determine when desired objectives of deferment are met. Associated Practices: Brush Management (314), Herbaceous Weed Control (315) Fence (382), Acess Control (472), Forage and Biomass Planting (512), Nutrient Management (590), Feed Management (592), Upland Wildlife Habitat Management (645).

**Before Situation:**

Over-grazed pasture, a pasture with a low condition score, or a newly established pasture converted from cropland with a need for proper grazing management.

**After Situation:**

Improve the health and vigor of the sward, through deferment of grazing and improve the nesting habitat for wildlife.

**Feature Measure:** Area of pasture deferred

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $754.33

**Scenario Cost/Unit:** $37.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Trucking, moving livestock to new paddock | 961 | Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs. | Mile | $5.44 | 5 | $27.20 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 30 | $600.60 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |

**Practice:** 528 - Prescribed Grazing

**Scenario** #40 - Habitat Mgt. Standard

**Scenario Description:**

Development and implementation of a grazing schedule that will enhance habitat components for the identified wildlife species of concern.

**Before Situation:**

Wildlife cover, shelter, food, water and movement are limited due to grazingland condition. Plant health and vigor are negatively impacted by one or more of the following: poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality may be impacted by increased runoff and erosion. In addition reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

A grazing system is altered and/or enhanced to benefit habitat for targeted wildlife species. Additional benefits include improved rangeland and/or pasture health, protection of sensitive areas, improved water quality and reduced risk of invasive or noxious weed encroachment.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $11,812.26

**Scenario Cost/Unit:** $23.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 3 | $324.99 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 100 | $1,855.00 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 60 | $3,069.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |

**Practice:** 528 - Prescribed Grazing

**Scenario** #41 - Habitat Mgt. Long Term Monitoring

**Scenario Description:**

Development and implementation of a grazing schedule that will enhance habitat components for the identified wildlife species of concern.

**Before Situation:**

Wildlife cover, shelter, food, water and movement are limited due to grazingland condition. Plant health and vigor are negatively impacted by one or more of the following: poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality may be impacted by increased runoff and erosion. In addition reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

**After Situation:**

A grazing system is altered and/or enhanced to benefit habitat for targeted wildlife species. Additional benefits include improved rangeland and/or pasture health, adequate rest and recovery periods, protection of sensitive areas, improved water quality and reduced risk of invasive or noxious weed encroachment. In order to achieve this, implementation of a rest/rotation or deferred grazing system will be required. A portion of the acres (20% for Sage Grouse Initiative) will be deferred during periods of critical wildlife use.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $19,036.83

**Scenario Cost/Unit:** $38.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 3 | $324.99 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 150 | $2,782.50 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 2 | $101.34 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 200 | $6,444.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 40 | $5,291.20 |

**Practice:** 528 - Prescribed Grazing

**Scenario** #47 - Prescribed Grazing Management for 5 Acres or less

**Scenario Description:**

Plan, implement and monitor a rotational grazing systgem that will enhance and maintain ecosystem function as well as optimize efficiency and economic return on small farm grazing lands.

**Before Situation:**

Area is degraded due to inappropriate timing, duration, frequency and intensity of animal utilization resulting in impaired ecosystem functions. Overuse and degradation of the soil and plant resources are occuriing and animal health is compromised.

**After Situation:**

Planned rotational movement of animals meet ecosystem functions due to proper timing, duration, frequency and intensity of animal utilization. Monitoring is showing that animals are in balance with available forage resources and ecological function and processes for soil, water and plant resources are being improved.

**Feature Measure:** acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $1,368.12

**Scenario Cost/Unit:** $273.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 28 | $902.16 |

**Practice:** 533 - Pumping Plant

**Scenario** #1 - Electric Powered Pump 3 Hp or less

**Scenario Description:**

A 2 hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 2 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water. Waste Transfer: Contaminated water needs to be moved to a containment facility.

**After Situation:**

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage. Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility. For all these scenarios a 2 hp electric pump is being used.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,654.30

**Scenario Cost/Unit:** $2,654.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Pump, <= 5 HP, pump and motor, fixed cost portion | 1009 | Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only. | Each | $1,309.33 | 1 | $1,309.33 |
| Pump, <= 5 HP, pump and motor, variable cost portion | 1010 | Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only. | Horsepower | $418.15 | 2 | $836.30 |

**Practice:** 533 - Pumping Plant

**Scenario** #2 - Electric Powered Pump 3 HP or less with Pressure Tank

**Scenario Description:**

A 2 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline.

**Before Situation:**

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water.

**After Situation:**

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,607.39

**Scenario Cost/Unit:** $3,607.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 0.25 | $102.95 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 0.25 | $7.79 |
| Pipe, PE, 1 1/4 in., DR 9 | 998 | Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $1.64 | 10 | $16.40 |
| Pump, <= 5 HP, pump and motor, fixed cost portion | 1009 | Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only. | Each | $1,309.33 | 1 | $1,309.33 |
| Pump, <= 5 HP, pump and motor, variable cost portion | 1010 | Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only. | Horsepower | $418.15 | 2 | $836.30 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $397.91 | 1 | $397.91 |

**Practice:** 533 - Pumping Plant

**Scenario** #3 - Electric Powered Pump 3 to 10 HP

**Scenario Description:**

This is a close-coupled 7.5 Hp electric-powered centrifugal pump, mounted on a platform. It is for a large, high-pressure (200 psi) livestock pipeline, used for watering livestock as part of a prescribed grazing system; or for pressurizing a medium-sized (200 gpm and 40 psi) irrigation system; or a medium-sized (400 gpm and 20 psi) waste transfer system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Livestock: Current system consists of a series of medium pressure and inefficient pump stations to transport water to a distant and higher-elevation watering facility. Irrigation: An existing irrigation system employs an inefficient, improperly sized pump, that prevents efficient water application resulting in water loss and high energy use. Waste Transfer: Various types of semi-solid or liquid waste are uncollected causing surface and ground water issues. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**After Situation:**

Livestock: A single, efficient, high-pressure pumping plant is installed, eliminating intermediate pump stations, reducing energy use and enabling better system management. Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency. Waste Transfer: Collected wastes are now efficiently transferred to an appropriate treatment or storage facility.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,695.75

**Scenario Cost/Unit:** $5,695.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 0.5 | $205.90 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion | 1011 | Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only. | Each | $3,582.81 | 1 | $3,582.81 |
| Pump, > 5 HP to 30 HP, pump and motor, variable cost portion | 1012 | Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only. | Horsepower | $136.48 | 7.5 | $1,023.60 |

**Practice:** 533 - Pumping Plant

**Scenario** #4 - Electric Powered Pump 10 to 40 HP

**Scenario Description:**

This is a close-coupled, 3-phase, 25 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a medium-sized (600 gpm and 50 psi) sprinkler or large microirrigation (850 gpm and 35 psi) system or a large-sized surface irrigaiton system (1,200 gpm) or a large-sized (1,200 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use. Waste Transfer: Various types of semi-solid or liquid waste are uncollected causing surface and ground water issues. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**After Situation:**

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency. Waste Transfer: Collected wastes are now efficiently transferred to an appropriate treatment or storage facility or to a distribution system.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,237.35

**Scenario Cost/Unit:** $11,237.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion | 1011 | Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only. | Each | $3,582.81 | 1 | $3,582.81 |
| Pump, > 5 HP to 30 HP, pump and motor, variable cost portion | 1012 | Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only. | Horsepower | $136.48 | 25 | $3,412.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #5 - Electric Powered Pump over 60 HP

**Scenario Description:**

This is a close-coupled, 3-phase, 70 HP electric-powered centrifugal pump mounted on a platform for pressurizing a large-sized (1,200 gpm and 50 psi) sprinkler or very large microirrigation (1,700 gpm and 35 psi) system or a very large-sized surface irrigation system (2,800 gpm) or a very large-sized (2,400 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

**Before Situation:**

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

**After Situation:**

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $28,841.28

**Scenario Cost/Unit:** $28,841.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 56 | $1,383.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 56 | $1,804.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 56 | $2,996.56 |
| **Materials** | | | | | | |
| Pump, > 30 HP, pump and motor, fixed cost portion | 1013 | Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only. | Each | $6,613.12 | 1 | $6,613.12 |
| Pump, >30 HP, Pump and motor, variable cost portion | 1014 | Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only. | Horsepower | $192.63 | 70 | $13,484.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #6 - Variable Frequency Drive

**Scenario Description:**

This is an installation of electrical and electronic components designed to vary the frequency of the voltage to an electric motor and thus the ability to vary the speed of the motor. This directly affects pressure and flowrate. This also could give the operator the flexibility to operate several systems separately or at the same time. In many cases, electric pumps at or under 10 Hp are single phase and need to be replaced by a 3-phase motor that is not covered in this scenario. Resource concerns: Insufficient water - Inefficient use of irrigation water; Inefficient energy use - Equipment and facilities and Farming/ranching practices and field operations. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; and 614 - Watering Facility.

**Before Situation:**

Standard electrical connection from electrical utility to pump motor. No capability to match pump output pressure and/or flowrate to field(s) need(s). Result is over/under pressure(s) and/or flow rate(s), possible hydraulic anomalies, energy loss, and or inefficient water application in the irrigation system.

**After Situation:**

VFD Modifications are implemented at the pump site to allow for varying the speed of a 40 Hp electric motor to match the pressure and flow requirements for a center pivot irrigation system.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $6,327.00

**Scenario Cost/Unit:** $126.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Variable Speed Drive, 50 HP | 1288 | Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only. | Horsepower | $126.54 | 50 | $6,327.00 |

**Practice:** 533 - Pumping Plant

**Scenario** #7 - Internal Combustion Powered Pump 7.5HP or less

**Scenario Description:**

The typical scenario supports replacement of a pump in an existing irrigation system on cropland with a 5 HP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. Scenario could also be used for a 5 HP pump for silage leachate, barnyard runoff, and milk house waste (as part of a waste transfer system) at farm headquarters. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

**After Situation:**

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,027.77

**Scenario Cost/Unit:** $4,027.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 0.25 | $102.95 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Pump, < 50 HP, Pump & ICE power unit | 1027 | Materials, labor, controls: < 50 HP Pump & ICE power unit | Horsepower | $706.50 | 5 | $3,532.50 |

**Practice:** 533 - Pumping Plant

**Scenario** #8 - Internal Combustion Powered Pump 7.5 to 39 HP

**Scenario Description:**

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 10 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

**Before Situation:**

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

**After Situation:**

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,199.18

**Scenario Cost/Unit:** $11,199.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1 | $411.80 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Pump, < 50 HP, Pump & ICE power unit | 1027 | Materials, labor, controls: < 50 HP Pump & ICE power unit | Horsepower | $706.50 | 10 | $7,065.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #9 - Internal Combustion Powered Pump 40 to 75 HP

**Scenario Description:**

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 71 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

**Before Situation:**

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

**After Situation:**

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $50,474.46

**Scenario Cost/Unit:** $50,474.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1 | $411.80 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Pump, > 70 HP, Pump & ICE power unit | 1029 | Materials, labor, controls: > 70 HP Pump & ICE power unit | Horsepower | $652.68 | 71 | $46,340.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #10 - Internal Combustion Powered Pump over 75 HP

**Scenario Description:**

The typical scenario supports replacement of a pump in an existing irrigation system or installation of a new pump on cropland that is 75 break HP pump or larger. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. Scenario could also be used for a pump for silage leachate, barnyard runoff, and milk house waste (as part of a waste transfer system) at farm headquarters. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

**After Situation:**

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $70,806.98

**Scenario Cost/Unit:** $70,806.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Pump, > 70 HP, Pump & ICE power unit | 1029 | Materials, labor, controls: > 70 HP Pump & ICE power unit | Horsepower | $652.68 | 100 | $65,268.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #11 - Windmill Powered Pump

**Scenario Description:**

A windmill is installed in order to supply a reliable water source for livestock and/or wildlife. The windmill includes the tower, concrete footings, wheel blade unit, sucker rod, down pipe, gear box, pump, plumbing, and well head protection concrete pad. The typical scenario will be a windmill system with a 10 ft diameter mill and 27-foot tower which is pumping from a 150-foot well. As a result of installing this windmill, resource concerns of inadequate stock water, plant establishment, growth, productivity, health, and vigor, and water quantity can be addressed. Resource Concerns: Insufficient stockwater.

**Before Situation:**

In a rangeland or pasture setting, a reliable source of water for livestock is not available, or the spacing between water sources is such that grazing distribution and plant health are adversely impacted.

**After Situation:**

A windmill, with a wheel ranging from 6' to 16' in diameter, will be installed over a well that is located to provide a reliable source of livestock water at the rate of at least 2 gpm, to facilitate proper grazing distribution and improved plant health. To increase reliability, water is pumped into a storage tank to provide a given number of days of supply. Installation includes the footings, wellhead protection concrete pad, tower, gear box, sail, sucker rod, down hole accessories, and a short outlet pipe to a storage tank.

**Feature Measure:** Each Mill Wheel

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,794.72

**Scenario Cost/Unit:** $12,794.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Aerial lift, telescoping bucket | 1893 | Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only. | Hours | $44.79 | 8 | $358.32 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Windmill, 10 ft. fan diameter | 1036 | Includes materials costs for windmill head and 27 foot tower | Each | $9,123.86 | 1 | $9,123.86 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #12 - Photovoltaic Powered Pump

**Scenario Description:**

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency. Resource Concerns: Insufficient stockwater. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

**Before Situation:**

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

**After Situation:**

The typical scenario assumes installation of a 600-watt photovoltaic (PV) panel, capable of operating a 1/4 Hp (0.25 Hp) solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Hp is defined as 746 watts; 3) It is reasonable to expect a 1/4 Hp solar-powered submersible pump to deliver about 1.5 gpm and develop a pressure at the pump outlet of about 60 psi.). The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

**Feature Measure:** Solar Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,205.48

**Scenario Cost/Unit:** $8,205.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Pipe, PE, 1 1/4 in., DR 9 | 998 | Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $1.64 | 250 | $410.00 |
| Solar Pumping System, Fixed Cost Portion | 2495 | Fixed cost portion of a solar powered pumping system. This portion is a base cost for a complete system including the photovoltaic panels, pumping plant, support braces, electric controllers, service drop, etc., and is not dependant on KiloWatt. The total cost will include this fixed cost plus a variable cost portion. Includes the cost of materials only. | Each | $5,506.61 | 1 | $5,506.61 |
| Solar Pumping System, Variable Cost Portion | 2496 | Variable cost portion of a solar powered pumping system. This portion IS dependent upon the total kilowatts of the photovoltaic panels, but also includes the pumping plant, support braces, electric controllers, service drop, etc. The total cost will include this variable cost plus a fixed cost portion. Includes the cost of materials only. | Kilowatt | $2,447.88 | 0.6 | $1,468.73 |

**Practice:** 533 - Pumping Plant

**Scenario** #13 - Water Ram Pump Regional

**Scenario Description:**

A water ram is used to transfer water from a live stream to a Watering Facility (614) or small Irrigation Reservoir (436) utilizing the energy of moving water to transfer a portion of that water to a higher elevation. It is anchored to a small concrete pad. Bypass water (which could easily be 90% of the water diverted from the stream) is returned to the stream or transferred in a pipe, to a lower elevation tank (614 or 436), without erosion or impairment to water quality. In the livestock scenario, the objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. The water ram may need to be fenced for protection from curious bovines. While it is generally not considered practical for irrigation, in the irrigation scenario, water can be retrieved from a stream and stored in a small 436 to provide water for a very small (0.1 acre) irrigation system. Resource Concerns: Insufficient stockwater. Associated Practices: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

**Before Situation:**

Water in a nearby stream is not available at the desired location, pressure and/or flow rate.

**After Situation:**

A 2" diameter inlet pipe is installed and connected to a water ram pump with all appurtenances and anchored to a concrete pad (9 ft x 4 ft x 5 in) or other appropriate secure base. Depending upon the application, either a 1-inch diameter Livestock Pipeline (516) or an Irrigation Pipeline (430) is installed from the water ram to a 5,000 gallon storage facility. Improved water quantity or quality, grazing management, plant diversity, animal health, and/or irrigation purposes as outlined in the appropriate NRCS irrigation system standard. A 2" water ram, with 10 gpm of inlet flow and 10 feet of drop, can supply about 1.0 gpm to a location about 50 feet higher than the water ram.

**Feature Measure:** Number of Ram Pumps

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,132.02

**Scenario Cost/Unit:** $2,132.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 0.5 | $205.90 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Pipe, PE, 1 1/4 in., DR 9 | 998 | Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $1.64 | 50 | $82.00 |
| Pump, Ram | 1114 | Ram pump kit, 2 inch. Includes materials and shipping only. | Each | $960.68 | 1 | $960.68 |

**Practice:** 533 - Pumping Plant

**Scenario** #14 - Livestock Nose Pump Regional

**Scenario Description:**

A Nose Pump is a diaphragm pump located in a pasture for the purpose of providing water to cattle. For a permanent installation, it is typical to also install Heavy Use Area Protection (561) (separate contract item) where the cattle congregate around the pump. It is powered and operated by cattle to transfer water from a stream to a drinking bowl. The objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation and while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. Generally one nose pump is adequate for 20 cattle. Resource Concerns: Insufficient stockwater; Inefficient energy use - Equipment and facilities. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

**Before Situation:**

Livestock have open access to a live stream or other existing natural water supply. Water supply is contaminated due to animal activity and stream banks are eroded on a daily basis. Improper cattle distribution results in poor water quality, poor grazing distribution, over grazing, and soil erosion.

**After Situation:**

One nose pump is installed with all appurtenances anchored to concrete pad with 6"x6"x10 Gauge reinforcement wire (9 ft x 4 ft x 5 in) or other appropriate secure base to supply water to cattle for improved livestock herd management. Additional Heavy Use Area Protection (561) in the form of crushed rock and at least 5 feet wide, may be installed (separate contract item) surrounding the concrete pad. Improved: water quality, soil quality, grazing management, plant diversity, and animal health.

**Feature Measure:** Number of Pumps

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $642.36

**Scenario Cost/Unit:** $642.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1.2 | $37.38 |
| Pipe, PE, 1 1/4 in., DR 9 | 998 | Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $1.64 | 25 | $41.00 |
| Nose Pump | 1052 | Materials and delivery. | Each | $459.31 | 1 | $459.31 |

**Practice:** 533 - Pumping Plant

**Scenario** #15 - Electric or Ram Manure Pump

**Scenario Description:**

This scenario involves a electric driven pump to transfer semi-solid/ liquid manure (as part of a waste transfer system) at the farm headquarters to a Waste Storage Facility - 313. Electricity is readily available and is a practical alternative. Another variation would be a electric motor driven horizontal ram pump set in a concrete base for small operations to transfer semi-solid/ liquid manure. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters Associated Practices include: 590 - Nutrient Management; 378 - Pond; 313 - Waste Storage Facility; 367 - Roofs and Covers; and 634 - Waste Transfer.

**Before Situation:**

Waste Transfer Setting: various types of semi-solid or liquid waste at the headquarters are uncollected causing surface and ground water issues. A transfer method for waste is needed. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**After Situation:**

Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility. Typical farm does not have 3 phase power. Maximum motor size is 10 hp but with delayed start can use 2 motors, thus use (2) 10 hp electric motors to run vertical shaft pump that will typically will move 300-600 gallons per minute and is kept mounted at that location. A similar substitution would be a hydraulic ram pump driven by an electric motor.Awaiting new cost component to use for a Vertical shaft pump, 10' deep powered by Twin 10 HP motors to allow use on single phase power

**Feature Measure:** Each pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $15,077.19

**Scenario Cost/Unit:** $15,077.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion | 1011 | Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only. | Each | $3,582.81 | 2 | $7,165.62 |
| Pump, > 5 HP to 30 HP, pump and motor, variable cost portion | 1012 | Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only. | Horsepower | $136.48 | 20 | $2,729.60 |
| Effluent pump appertenances | 2162 | Controller for pump system with timer, event counter and run time meter, 3 float switch assembly and alarm system with electrical connections. | Each | $4,334.78 | 1 | $4,334.78 |

**Practice:** 533 - Pumping Plant

**Scenario** #16 - Large piston Manure Pump

**Scenario Description:**

This scenario involves a large piston pump with hopper used to transfer heavily bedded manure or sand laden manure (as part of a waste transfer system) at the farm headquarters to a Waste Storage Facility - 313. Pump is set in concrete pit. Additional safety value is requried. Site topography or limited space requires transfer of wastes to other location. Gravity not an option. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Associated Practices include: 590 - Nutrient Management; 378 - Pond; 313 - Waste Storage Facility; 367 - Roofs and Covers; and 634 - Waste Transfer and Roofs and Cover(367)

**Before Situation:**

Waste Transfer Setting: various types of semi-solid or liquid waste at the headquarters are uncollected causing surface and ground water issues. A transfer method for waste is needed. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**After Situation:**

A large piston pump with hopper set in a concrete pit used to transfer semi-solid manure with sand (as part of a waste transfer system) at the farm headquarters from a Waste Storage Facility - 313. An additional value is installed to allow access to pump for repairs. Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility.

**Feature Measure:** Each pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $49,141.50

**Scenario Cost/Unit:** $49,141.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1.5 | $617.70 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 4 | $2,161.20 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 2 | $298.48 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1.5 | $46.73 |
| Swing Check Valve, metal, 12 in. | 2082 | 12 inch swing check valve for back flow prevention, ductile iron metal body with flange mount and lever shaft. Materials and shipping only. | Each | $5,144.69 | 1 | $5,144.69 |
| Pump, Manure, Solid Piston | 2157 | Pump, Manure, Solid Piston, Hydraulically Actuated, 12 in. or greater discharge, 7.5 HP w/ accessories. Includes delivery. | Each | $38,611.91 | 1 | $38,611.91 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 533 - Pumping Plant

**Scenario** #17 - <50gpm Irrg PTO pump

**Scenario Description:**

This scenario involves a smaller capacity PTO driven pump to transfer water for an irrigation system from a Pond - 378 (includes backflow prevention as appropriate) or other suitable water source to cropland. PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 430 - Irrigation Pipeline; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management

**Before Situation:**

Irrigation Setting: An existing surface irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**After Situation:**

Irrigation Setting: A properly designed PTO-driven pump is installed, to transfer water to an Irrigation Pipeline (430) or Irrigation Canal or Lateral (320). The pump typically will move 30 gallons per minute(irrigation)

**Feature Measure:** Each pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,065.61

**Scenario Cost/Unit:** $1,065.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Pump, Ag Water PTO, 22 GPM | 1115 | Ag Water PTO Pump, 22 GPM, 1 in. diameter. Includes materials, labor, controls and shipping. | Each | $908.51 | 1 | $908.51 |
| Aggregate, gravel, washed, pea gravel | 1331 | Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $34.53 | 3 | $103.59 |

**Practice:** 533 - Pumping Plant

**Scenario** #18 - 50 to 500 gpm PTO Pump

**Scenario Description:**

This scenario involves a PTO driven pump to transfer water for an irrigation system from a Pond - 378 (includes backflow prevention as appropriate) or other suitable water source to cropland. PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative. Waste Transfer: PTO pump can also be used to transfer low solids manure from existing waste storage facility to remote storage or in pipeline for final application on land. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 430 - Irrigation Pipeline; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management

**Before Situation:**

Irrigation Setting: An existing surface irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**After Situation:**

Irrigation Setting: A properly designed PTO-driven pump is installed, to transfer water to an Irrigation Pipeline (430) or Irrigation Canal or Lateral (320). Waste Transfer Setting: Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility or to an irrigation system. The pump typically will move 300 gallons per minute(irrigation) or 200 gpm (waste)and is portable so that it can be used at several locations.

**Feature Measure:** Each pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,780.05

**Scenario Cost/Unit:** $4,780.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 3 | $93.45 |
| Pump, Ag Water PTO, 300 GPM | 1116 | Ag water PTO Pump, 300 GPM, 3 in. diameter. Includes materials, labor, controls and shipping. | Each | $4,633.09 | 1 | $4,633.09 |

**Practice:** 533 - Pumping Plant

**Scenario** #19 - >500 gpm PTO Pump

**Scenario Description:**

This scenario involves a PTO driven pump to transfer water for an irrigation system from a Pond - 378 (includes backflow prevention as appropriate) or other suitable water source to cropland. PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative. Waste Transfer: PTO pump can also be used to transfer low solids manure from existing waste storage facility to remote storage or in pipeline for final application on land. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 430 - Irrigation Pipeline; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management, Waste Transfer 634

**Before Situation:**

Irrigation Setting: An existing surface irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**After Situation:**

Irrigation Setting: A properly designed PTO-driven pump is installed, to transfer water to an Irrigation Pipeline (430) or Irrigation Canal or Lateral (320). Waste Transfer Setting: Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility or to an irrigation system. The pump typically will move 300 gallons per minute(irrigation) or 200 gpm (waste)and is portable so that it can be used at several locations.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,052.29

**Scenario Cost/Unit:** $8,052.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 2.5 | $62.20 |
| Pump, Ag Water PTO, 1,000 GPM | 1923 | Materials, labor, controls: Ag Water PTO Pump 1,000 GPM - 8 in. | Each | $7,936.58 | 1 | $7,936.58 |

**Practice:** 533 - Pumping Plant

**Scenario** #20 - 1 hp pump or Siphon or Flout

**Scenario Description:**

A 1 hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system it can be a 1 hp pump or for gravity situations an equal alternative is a siphon or flout to dose or transfer wastes. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water. Waste Transfer: Contaminated water needs to be moved to a containment facility.

**After Situation:**

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage. Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility. Sites that support gravity flow but need dosing can also use a siphon or flout to accomplish the transfer.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,959.17

**Scenario Cost/Unit:** $1,959.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Pump, <= 5 HP, pump and motor, fixed cost portion | 1009 | Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only. | Each | $1,309.33 | 1 | $1,309.33 |
| Pump, <= 5 HP, pump and motor, variable cost portion | 1010 | Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only. | Horsepower | $418.15 | 1 | $418.15 |

**Practice:** 533 - Pumping Plant

**Scenario** #21 - Turbine Pump

**Scenario Description:**

The typical scenario is for a 700 GPM pump and supports replacement of a pump in an existing irrigation system or installation of a new pump on cropland. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. Resource Concerns: Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management;

**Before Situation:**

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs.

**After Situation:**

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage.

**Feature Measure:** 1 Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $20,104.39

**Scenario Cost/Unit:** $20,104.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Pump, Turbine, Cast Iron, fixed cost portion | 2148 | Fixed cost portion of cast iron turbine pump with appurtenances. Includes pump, appurtenances, and labor to install. | Each | $14,798.39 | 1 | $14,798.39 |
| Pump, Turbine, Cast Iron, variable cost portion | 2149 | Variable cost portion of cast iron turbine pump with appurtenances. Includes pump, appurtenances, and labor to install. | Gallons per Minute | $7.58 | 700 | $5,306.00 |

**Practice:** 533 - Pumping Plant

**Scenario** #52 - Electric Powered Pump 3 Hp or less with pressure tank and pump housing

**Scenario Description:**

A 2 hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 2 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water. Waste Transfer: Contaminated water needs to be moved to a containment facility.

**After Situation:**

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage. Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility. For all these scenarios a 2 hp electric pump is being used.

**Feature Measure:** Pump Size Matchs need

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,422.41

**Scenario Cost/Unit:** $8,422.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $272.05 | 4 | $1,088.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1 | $31.15 |
| Pipe, PE, 1 1/4 in., DR 9 | 998 | Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $1.64 | 20 | $32.80 |
| Pump, <= 5 HP, pump and motor, fixed cost portion | 1009 | Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only. | Each | $1,309.33 | 1 | $1,309.33 |
| Pump, <= 5 HP, pump and motor, variable cost portion | 1010 | Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only. | Horsepower | $418.15 | 2 | $836.30 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $397.91 | 1 | $397.91 |
| Pumping Plant Pit, Concrete, 1200 Gallon | 1922 | Precast concrete septic tank structure, 1200 gal capacity, with access port and ladder. Materials only. | Each | $1,437.56 | 1 | $1,437.56 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 533 - Pumping Plant

**Scenario** #61 - Electric Powered Pump 40 to 60 HP

**Scenario Description:**

This is a close-coupled, 3-phase, 50 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a large-sized (1,200 gpm and 50 psi) sprinkler or very large microirrigation (1,700 gpm and 35 psi) system or a large-sized surface irrigation system (2,800 gpm) or a large-sized (2,400 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

**Before Situation:**

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

**After Situation:**

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

**Feature Measure:** Each Pump

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $20,882.36

**Scenario Cost/Unit:** $20,882.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Pump, > 30 HP, pump and motor, fixed cost portion | 1013 | Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only. | Each | $6,613.12 | 1 | $6,613.12 |
| Pump, >30 HP, Pump and motor, variable cost portion | 1014 | Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only. | Horsepower | $192.63 | 50 | $9,631.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #124 - Electric-Powered Pump <= 5 Hp

**Scenario Description:**

A 1 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water. Waste Transfer: Contaminated water needs to be moved to a containment facility.

**After Situation:**

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage. Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $3,330.29

**Scenario Cost/Unit:** $1,665.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1 | $411.80 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Materials** | | | | | | |
| Pump, <= 5 HP, pump and motor, fixed cost portion | 1009 | Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only. | Each | $1,309.33 | 1 | $1,309.33 |
| Pump, <= 5 HP, pump and motor, variable cost portion | 1010 | Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only. | Horsepower | $418.15 | 2.5 | $1,045.38 |

**Practice:** 533 - Pumping Plant

**Scenario** #125 - Electric-Powered Pump <= 5 HP with Pressure Tank

**Scenario Description:**

A 1 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline.

**Before Situation:**

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water.

**After Situation:**

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,792.12

**Scenario Cost/Unit:** $2,792.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 0.25 | $102.95 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Materials** | | | | | | |
| Pump, <= 5 HP, pump and motor, fixed cost portion | 1009 | Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only. | Each | $1,309.33 | 1 | $1,309.33 |
| Pump, <= 5 HP, pump and motor, variable cost portion | 1010 | Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only. | Horsepower | $418.15 | 1 | $418.15 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $397.91 | 1 | $397.91 |

**Practice:** 533 - Pumping Plant

**Scenario** #126 - Electric-Powered Pump >5 HP<=30 hp

**Scenario Description:**

This is a close-coupled, 3-phase, 20 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a medium-sized (500 gpm and 50 psi) sprinkler or large microirrigation (1,000 gpm and 30 psi) system or a large-sized surface irrigation system (1,500 gpm) or a medium-sized (1,000 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

**Before Situation:**

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

**After Situation:**

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $15,056.47

**Scenario Cost/Unit:** $752.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 56 | $1,383.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 56 | $1,804.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 56 | $2,996.56 |
| **Materials** | | | | | | |
| Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion | 1011 | Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only. | Each | $3,582.81 | 1 | $3,582.81 |
| Pump, > 5 HP to 30 HP, pump and motor, variable cost portion | 1012 | Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only. | Horsepower | $136.48 | 20 | $2,729.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #127 - Electric-Powered Pump >30 hp <=75

**Scenario Description:**

This is a close-coupled, 3-phase, 50 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a large-sized 1,000 gpm and 50 psi) sprinkler or very large microirrigation (2,000 gpm and 30 psi) system or a very large-sized surface irrigation system (3,000 gpm) or a large-sized (2,000 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

**Before Situation:**

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

**After Situation:**

A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency

**Feature Measure:** <Unknown>

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $32,054.36

**Scenario Cost/Unit:** $641.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 16 | $851.36 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 56 | $1,383.20 |
| Portable Welder | 1407 | Portable field welder. Equipment only. Labor not included. | Hours | $20.21 | 16 | $323.36 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hours | $272.05 | 16 | $4,352.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 56 | $2,864.96 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 56 | $2,996.56 |
| **Materials** | | | | | | |
| Pump, > 30 HP, pump and motor, fixed cost portion | 1013 | Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only. | Each | $6,613.12 | 1 | $6,613.12 |
| Pump, >30 HP, Pump and motor, variable cost portion | 1014 | Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only. | Horsepower | $192.63 | 50 | $9,631.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #128 - Electric-Powered Pump >75

**Scenario Description:**

This is a close-coupled, 3-phase, 100 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a very large (2500 gpm and 50 psi) sprinkler or a large-sized surface irrigation system (3,000 gpm). Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

**Before Situation:**

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

**After Situation:**

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $35,847.66

**Scenario Cost/Unit:** $358.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 4 | $1,647.20 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 56 | $1,383.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 56 | $1,804.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 56 | $2,996.56 |
| **Materials** | | | | | | |
| Pump, > 30 HP, pump and motor, fixed cost portion | 1013 | Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only. | Each | $6,613.12 | 1 | $6,613.12 |
| Pump, >30 HP, Pump and motor, variable cost portion | 1014 | Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only. | Horsepower | $192.63 | 100 | $19,263.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #130 - Internal Combustion-Powered Pump <= 50HP

**Scenario Description:**

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 30 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

**Before Situation:**

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

**After Situation:**

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $25,329.18

**Scenario Cost/Unit:** $844.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1 | $411.80 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Pump, < 50 HP, Pump & ICE power unit | 1027 | Materials, labor, controls: < 50 HP Pump & ICE power unit | Horsepower | $706.50 | 30 | $21,195.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #131 - Internal Combustion-Powered Pump > 50 to 70 HP

**Scenario Description:**

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 60 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

**Before Situation:**

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

**After Situation:**

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 60.00

**Scenario Total Cost:** $44,127.18

**Scenario Cost/Unit:** $735.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1 | $411.80 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Pump, > 50 to 70 HP, Pump & ICE power unit | 1028 | Materials, labor, controls: > 50 to 70 HP Pump & ICE power unit | Horsepower | $666.55 | 60 | $39,993.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #132 - Internal Combustion-Powered Pump > 70 HP

**Scenario Description:**

The typical scenario supports replacement of a pump in an existing irrigation system or installation of a new pump on cropland that is 75 break HP pump or larger. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. Scenario could also be used for a pump for silage leachate, barnyard runoff, and milk house waste (as part of a waste transfer system) at farm headquarters. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

**Before Situation:**

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

**After Situation:**

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $70,806.98

**Scenario Cost/Unit:** $708.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Pump, > 70 HP, Pump & ICE power unit | 1029 | Materials, labor, controls: > 70 HP Pump & ICE power unit | Horsepower | $652.68 | 100 | $65,268.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #133 - Tractor Power Take Off (PTO) Pump

**Scenario Description:**

This scenario involves a PTO driven pump to either transfer water for an irrigation system from a Pond - 378 (includes backflow prevention as appropriate) to cropland or; to transfer semi-solid/ liquid manure (as part of a waste transfer system) at the farm headquarters from a Waste Storage Facility - 313, to an irrigation system or waste treatment facility. In both cases, a PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 430 - Irrigation Pipeline; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 590 - Nutrient Management; 378 - Pond; 313 - Waste Storage Facility; and 634 - Waste Transfer.

**Before Situation:**

Irrigation Setting: An existing surface irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; Waste Transfer Setting: various types of semi-solid or liquid waste at the headquarters are uncollected causing surface and ground water issues. A transfer method for waste is needed. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

**After Situation:**

Irrigation Setting: A properly designed PTO-driven pump is installed, to transfer water to an Irrigation Pipeline (430) or Irrigation Canal or Lateral (320). Waste Transfer Setting: Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility or to an irrigation system. The pump typically will move 2,000 gallons per minute and is portable so that it can be used at several locations.

**Feature Measure:** Pump Power Requirement

**Scenario Unit:** Brake Horse Power

**Scenario Typical Size:** 60.00

**Scenario Total Cost:** $10,527.06

**Scenario Cost/Unit:** $175.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Pump, Ag Water PTO, 1,000 GPM | 1923 | Materials, labor, controls: Ag Water PTO Pump 1,000 GPM - 8 in. | Each | $7,936.58 | 1 | $7,936.58 |

**Practice:** 533 - Pumping Plant

**Scenario** #168 - Windmill-Powered Pump

**Scenario Description:**

A windmill is installed in order to supply a reliable water source for livestock and/or wildlife. The windmill includes the tower, concrete footings, wheel blade unit, sucker rod, down pipe, gear box, pump, plumbing, and well head protection concrete pad. The typical scenario will be a windmill system with a 10 ft diameter mill and 27-foot tower which is pumping from a 150-foot well. As a result of installing this windmill, resource concerns of inadequate stock water, plant establishment, growth, productivity, health, and vigor, and water quantity can be addressed. Resource Concerns: Insufficient stockwater.

**Before Situation:**

In a rangeland or pasture setting, a reliable source of water for livestock is not available, or the spacing between water sources is such that grazing distribution and plant health are adversely impacted.

**After Situation:**

A windmill, with a wheel ranging from 6' to 16' in diameter, will be installed over a well that is located to provide a reliable source of livestock water at the rate of at least 2 gpm, to facilitate proper grazing distribution and improved plant health. To increase reliability, water is pumped into a storage tank to provide a given number of days of supply. Installation includes the footings, wellhead protection concrete pad, tower, gear box, sail, sucker rod, down hole accessories, and a short outlet pipe to a storage tank.

**Feature Measure:** Diameter of Mill Wheel

**Scenario Unit:** Feet

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $12,794.72

**Scenario Cost/Unit:** $1,279.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Aerial lift, telescoping bucket | 1893 | Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only. | Hours | $44.79 | 8 | $358.32 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Windmill, 10 ft. fan diameter | 1036 | Includes materials costs for windmill head and 27 foot tower | Each | $9,123.86 | 1 | $9,123.86 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 533 - Pumping Plant

**Scenario** #171 - Photovoltaic-Powered Pump, <4 kW

**Scenario Description:**

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency. Resource Concerns: Insufficient stockwater. Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

**Before Situation:**

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

**After Situation:**

The typical scenario assumes installation of 1 kilowatt of photovoltaic (PV) panels, capable of operating a 1 horsepower solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Horsepower is defined as 0.746 kilowatts.. The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, controller, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

**Feature Measure:** Pumping plant photovoltaic power

**Scenario Unit:** Kilowatt

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,721.37

**Scenario Cost/Unit:** $9,721.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Solar Pumping System, Fixed Cost Portion | 2495 | Fixed cost portion of a solar powered pumping system. This portion is a base cost for a complete system including the photovoltaic panels, pumping plant, support braces, electric controllers, service drop, etc., and is not dependant on KiloWatt. The total cost will include this fixed cost plus a variable cost portion. Includes the cost of materials only. | Each | $5,506.61 | 1 | $5,506.61 |
| Solar Pumping System, Variable Cost Portion | 2496 | Variable cost portion of a solar powered pumping system. This portion IS dependent upon the total kilowatts of the photovoltaic panels, but also includes the pumping plant, support braces, electric controllers, service drop, etc. The total cost will include this variable cost plus a fixed cost portion. Includes the cost of materials only. | Kilowatt | $2,447.88 | 1 | $2,447.88 |

**Practice:** 548 - Grazing Land Mechanical Treatment

**Scenario** #1 - Pastureland Mechanical Treatment

**Scenario Description:**

A chisel plow or subsoiler is used to break restrictive layers to increase water infiltration, and break up sod and thatch on introduced species. The depth of treatment will be 1" deeper than the restictive layer.

**Before Situation:**

Forage growth on pastureland is limited by compacted soils layers and /or has dense sod with a thatch build up.

**After Situation:**

Forage growth is increased due to greater rooting depths and water infiltration.

**Feature Measure:** area of treatmnent

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $981.85

**Scenario Cost/Unit:** $39.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Ripper or subsoiler, 16 to 36 inch depth | 1235 | Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor. | Acres | $24.06 | 25 | $601.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 554 - Drainage Water Management

**Scenario** #1 - Drainage Water Management (DWM)

**Scenario Description:**

This scenario is the process of managing water discharges from surface and/or subsurface agricultural drainage systems by reducing nutrient loading into surface waters. Typical systems consist of a 40 acre field with existing drainage tile lines and installed water control structures. The operator goes to the field in order to adjust water control structures (riser boards). While on site the date and adjustment information is recorded/logged. The number of yearly adjustments is based on 6 trips to a field 5 miles from headquarters. The field time to make and record each adjustment is 0.5 hours per structure (including travel time). The typical field will contain 3 water control structures; 1 structure controsl field water levels and 2 structures control a single denitrifying bioreactor. Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Associated Practices: 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management .

**Before Situation:**

Existing drainage systems are in place and water flows uncontrolled.

**After Situation:**

Existing drainage systems are managed to reduce flow of field drainage waters from the site and reduce nitrate loading by denitrification.

**Feature Measure:** Number of Control Structures

**Scenario Unit:** Each

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $496.19

**Scenario Cost/Unit:** $165.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 0.33 | $35.75 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 9 | $460.44 |

**Practice:** 554 - Drainage Water Management

**Scenario** #19 - Automated Drainage Water Management

**Scenario Description:**

This scenario is the process of managing the drainage water discharge volume and water table elevation by regulating the flow from surface and/or subsurface agricultural drainage systems utilizing automation. Typical systems consist of a field with a fairly flat slope (less than 2% and preferably less than 1%) with existing drainage tile lines and installed water control structures which are operated with automated slide gates, and telemetry data systems coupled with cloud data management. Typical affected area for an automated drainage water management structure is 10 to 20 acres. The operator, from handheld device, adjusts water control structures (gate elevation) and logs data. Educational meeting is conducted between consultant and operator(s) annually for essential knowledge transfer Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Associated Practices: 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management.

**Before Situation:**

Existing inefficient drainage systems are in place and water flows uncontrolled, resulting in sediment and nutrient laden outflow entering ditches or streams.

**After Situation:**

Existing drainage systems are managed utilizing telemetry and real-time data to retain moisture in the soil for plant uptake and to allow for enhanced nutrient utilization.

**Feature Measure:** Acres of Managed Drainage

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $545.54

**Scenario Cost/Unit:** $10.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 7.5 | $383.70 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** 557 - Row Arrangement

**Scenario** #1 - Establishing Row Direction, Grade, & Length.

**Scenario Description:**

Includes establishing crop rows in direction, grade and length by setting a baseline by ground survey, GPS, GIS, or other appropriate methods that will provide the planned results to provide drainage, erosion control. Used as part of drainage system, control runoff, reduces soil erosion. Crop rows on planned grades and lengths. Direction and length of rows will vary according to local situation. Planner will consider crop, exposure, aspect, flow of water, and use of additional practices. May be used on dryland areas to fully and effectively utilize rainfall. This scenario addresses the resource concern of Soil Erosion / irrigation induced soil erosion / sheet & rill. Associated Practices: Land Smoothing (466), Precision Land Leveling(462), Irrigation Land leveling (464), Grassed Waterway (412), Sediment Basin (350), Terrace (600), Filter Strip (393), Irrigation Water Management (449), Grade Stabilization (410), Conservation Cover (327), and Cover Crop (340)

**Before Situation:**

This practice applies to all crop land areas where there is a need for reducing soil erosion ,improving irrigation efficiency, improving drainage and improving production practices which improve energy efficiency and minimize the application of chemicals and nutrients overlapping ( Parallel System) while improving the water quality to receiving water bodies. Row arrangement is applied as part of a surface drainage system for a field where the rows are planned to carry runoff to main or lateral drains; to facilitate optimum use of water in graded furrow irrigation systems; in dryland areas where it is necessary to control the grade of rows to more fully utilize available rainfall; on sloping land where control of the length, grade and direction of the rows can help reduce soil erosion, as a stand-alone practice or in conjunction with other conservation practices

**After Situation:**

Crop rows are established in direction, grade and length by setting a baseline by ground survey, GPS, GIS, or other appropriate methods that will provide the planned results. To remove irregularities on land surface with special equipment, that may require a needed change of length, direction, or slope of crop rows and slope, the field will need to be smoothed or leveled to correct irregularities and address drainage or Irrigation Issues, then other Conservation Practices should be used to address these concerns by using Land Smoothing (466), Precision Land Leveling ( 462), Irrigation Land Leveling (464), Other associated practices that maybe used are Grassed Waterway (412), Sediment Basin (350), Terrace (600), Filter Strip (393), Irrigation Water Management (449), Grade Stabilization (410), Conservation Cover (327), and Cover Crop (340)

**Feature Measure:** Area to Set Row Direction, Grade,

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $153.48

**Scenario Cost/Unit:** $6.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |

**Practice:** 558 - Roof Runoff Structure

**Scenario** #1 - Roof Gutter

**Scenario Description:**

A roof runoff structure, consisting of gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313),Roofs and Covers (367), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

**Before Situation:**

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

**After Situation:**

A gutter, downspout, and a separate outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ft serviced with gutter, four downspouts, and appurtances. Use underground outlet or other associated practice to carry water beyond end of downspout.

**Feature Measure:** Linear Length of gutter

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $2,321.28

**Scenario Cost/Unit:** $11.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 36 | $1,159.92 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Gutter, Aluminum, Small | 1689 | Aluminum gutter, 4 to 6 in. width with hangers. Materials only. | Feet | $3.25 | 200 | $650.00 |
| Downspout, Aluminum | 1700 | Aluminum downspout 3 to 5 inch width with hangers. Materials only. | Feet | $3.92 | 60 | $235.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 558 - Roof Runoff Structure

**Scenario** #2 - Roof Gutter with Fascia

**Scenario Description:**

A roof runoff structure, consisting of gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Roofs and Covers (367),Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

**Before Situation:**

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

**After Situation:**

A gutter, downspout, and a separate outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ft serviced with gutter, four downspouts, and appurtances. New 2' x8" facia board needed for proper attachement . Use underground outlet or other associated practice to carry water beyond end of downspout. Payment based on measured length of installed gutters and downspouts.

**Feature Measure:** Linear Length of gutter w/fascia

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $4,249.81

**Scenario Cost/Unit:** $21.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 54 | $1,739.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Dimension Lumber, untreated, rot resistant | 1613 | Untreated dimension lumber with nominal thickness equal or less than 2 inches, milled from a rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.65 | 267 | $1,241.55 |
| Gutter, Aluminum, Small | 1689 | Aluminum gutter, 4 to 6 in. width with hangers. Materials only. | Feet | $3.25 | 200 | $650.00 |
| Downspout, Aluminum | 1700 | Aluminum downspout 3 to 5 inch width with hangers. Materials only. | Feet | $3.92 | 60 | $235.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 558 - Roof Runoff Structure

**Scenario** #3 - Roof Gutter, 6 inches wide with runoff Storage Tank

**Scenario Description:**

A roof runoff structure, consisting of gutter(s), downspout(s), and a storage tank. Used to keep roof clean water runoff uncontaminated, provide storage for on-farm use of roof water and a stable outlet for any excess to ground surface in a way that avoids erosion. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

**Before Situation:**

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

**After Situation:**

A gutter and downspouts servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ln.ft. serviced with gutter, downspouts, and appurtances. A 1,500 gallon tank is installed for storage and use of roof runoff.

**Feature Measure:** Linear Length of Roof to be Guttere

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $4,395.32

**Scenario Cost/Unit:** $21.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 2 | $12.82 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 2 | $62.30 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 110 | $729.30 |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.20 | 1500 | $1,800.00 |
| Gutter, Aluminum, Small | 1689 | Aluminum gutter, 4 to 6 in. width with hangers. Materials only. | Feet | $3.25 | 200 | $650.00 |
| Downspout, Aluminum | 1700 | Aluminum downspout 3 to 5 inch width with hangers. Materials only. | Feet | $3.92 | 60 | $235.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.41 | 100 | $41.00 |

**Practice:** 558 - Roof Runoff Structure

**Scenario** #4 - Concrete Curb

**Scenario Description:**

A roof runoff structure, consisting of a concrete curb or parabolic channel installed on existing impervious surface or the ground with appropriate outlet facilities. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of an on-ground concrete curb. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Roofs and Covers (367), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

**Before Situation:**

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

**After Situation:**

A concrete curb or parabolic channel and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Concrete curb (8" high) on a 2' wide slab extending the length of a 200' roof with additional length (5') for stable outlet.

**Feature Measure:** Linear Length of Curb

**Scenario Unit:** Feet

**Scenario Typical Size:** 205.00

**Scenario Total Cost:** $4,525.21

**Scenario Cost/Unit:** $22.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 8 | $1,710.72 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 3 | $1,620.90 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 8 | $20.48 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 5 | $60.30 |
| Hauling, bulk, highway truck | 1615 | Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck. | Cubic Yard Mile | $0.38 | 130 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 8 | $249.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 558 - Roof Runoff Structure

**Scenario** #5 - Trench Drain

**Scenario Description:**

A roof runoff structure, consisting of a trench filled with rock, with a polyethylene, corrugated, perforated drain tile installed in trench bottom. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Environmental/design considerations, for example – snow loads, or a building without proper structural support needed for gutters dictate the use of a trench drain. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317) ,Roofs and Covers (367), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

**Before Situation:**

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

**After Situation:**

A 2' deep by 3' wide by 200 long deep rock filled, tile drained trench. Trench system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. If discharge point needs to be elsewhere use additional applicable practice.

**Feature Measure:** Linear Length Drain

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $2,488.48

**Scenario Cost/Unit:** $12.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 222 | $315.24 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 44 | $112.64 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 44 | $1,370.60 |
| Pipe, HDPE, 4 in., PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only. | Feet | $0.72 | 220 | $158.40 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 558 - Roof Runoff Structure

**Scenario** #6 - Stone Infiltration Sump

**Scenario Description:**

A roof runoff structure, consisting of a square hole lined with geotextile and filled with rock and covered with soil. Used to redirect roof runoff for gound water recharge and reduce surface flow into streams. Reduces erosion and helps improve water quality. Associated practices include Waste Storage Facility (313), Agrichemical Handling Facility (309), Composting Facility (317), Roofs and Covers (367), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362) Critical Area Seeding (342)

**Before Situation:**

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

**After Situation:**

Two, 6' x6' x 8' deep holes were dug and lined with geotextile and filled to within 1.5' of suface. The remaining surface filled with soil. Each has a 10' of 4" pipe coming from a downspout or underground outlet into this sump and 10 ' of 4" overflow pipe is also included. Payment includes all work and piping. Seeding will be done by others when site work done. Sumps located away from downspouts and good outlets will require additional piping under Underground Outlet (620)

**Feature Measure:** Each stone infiltration sump

**Scenario Unit:** Each

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $2,398.13

**Scenario Cost/Unit:** $1,199.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 30 | $42.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 16 | $498.40 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 40 | $265.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 558 - Roof Runoff Structure

**Scenario** #13 - Roof Gutter with Storage Tank

**Scenario Description:**

A water catchment and retention system for collecting roof runoff from a livestock, poultry, nursery or similar operation utilizing tanks to store the water. Catch water from the roof is collected in gutters and is transported by downspout and pipe to storage tanks. Water will be stored and subsequently used on-farm. Tanks will have overflow protection. Overflow will be routed to a suitable outlet. This typical scenario is based on catchment and retention of a four house poultry operation (4 â€“ 40x400 poultry houses). Water collection for 0.8 inches (25 yr-5min storm event in SE). Resource concerns: Sedimentation, erosion, excessive nutrients in surface water, storm water runoff. Associated practices: 342 - Critical Area Treatment, 516- Pipeline, 620-Underground Outlet, 561-Heavy Use Area Protection

**Before Situation:**

Erosion, sedimentation and nutrient deposition coming from roof runoff from poultry houses. Large roofs produce excess storm water runoff for the farm. Numerous farms in a watershed result in cumulative excess storm water runoff in the watershed resulting in degradation to receiving streams.

**After Situation:**

The guttering and downspouts collects the roof runoff and the water is conveyed through a pipe, to a storage tank for reuse . This system is the primary collection component of a Storm water runoff will be reduced. Runoff and erosion control on the farm will be easier handled. Streambank erosion in the watershed will be reduced. Tanks will have overflow protection. Overflow will be routed to a suitable outlet.

**Feature Measure:** Volume of collection

**Scenario Unit:** Gallons

**Scenario Typical Size:** 33,000.00

**Scenario Total Cost:** $76,379.94

**Scenario Cost/Unit:** $2.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 24 | $1,277.04 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 72 | $3,683.52 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SCH 40 | 981 | Materials: - 8 inch - PVC - SCH 40 - ASTM D1785 | Feet | $17.62 | 200 | $3,524.00 |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.20 | 3000 | $3,600.00 |
| Pipe, HDPE, 8 in,, PCPT, Single Wall | 1272 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8 inch diameter - ASTM F667. Material cost only. | Feet | $2.66 | 3800 | $10,108.00 |
| Gutter, Plastic, Small | 1389 | 5 inch PVC guttering emptying into a 4 inch PVC Sch-40 pipe. | Feet | $1.04 | 3200 | $3,328.00 |
| Tank, Fiberglass Enclosed Storage, 10,000 gallon | 1919 | 10,000 gallon capacity enclosed fiberglass water storage tank. Includes tank anchoring materials and delivery. | Each | $14,306.50 | 3 | $42,919.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 558 - Roof Runoff Structure

**Scenario** #36 - High Tunnel Roof Runoff Trench Drain and Storage

**Scenario Description:**

NOT TO BE USED WHERE CONTAMINATED SOIL EXIST. An urban agricultural producer wishes to address a resource concern such as a need for water or erosion around high tunnel from roof runoff and collect and store roof runoff for reuse as supplemental irrigation/water supply water. Associated Practice: High Tunnel

**Before Situation:**

Producer has resource concern such as erosion caused by roof runoff from an installed high tunnel

**After Situation:**

A 2' deep by 3' wide by 100' long trench filled with clean stone w/ 4-8 inch perforated PE pipe located on both sides of the hightunnel collect the roof runoff and divert to an underground storage tank. Trench drain typically installed at ground level under the edge of a high tunnel. Outlet from 'Trench Drain' conveys water to a buried storage tank. Typically installed to capture water for reuse or to stop erosion caused by concentrated roof runoff.

**Feature Measure:** Length of hightunnel

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,430.54

**Scenario Cost/Unit:** $44.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 227 | $322.34 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 10 | $64.10 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 72 | $277.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 46 | $1,144.48 |
| Prefabricated concrete septic tank, 1500 gal | 1738 | Precast concrete septic tank, 1,500 gal. Materials only. | Each | $1,715.85 | 1 | $1,715.85 |
| Pipe, HDPE, 6 in., PCPT, Single Wall | 2548 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 6 inch diameter - ASTM F405. Includes material cost only. | Feet | $1.74 | 20 | $34.80 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 560 - Access Road

**Scenario** #1 - Constructed road with Heavy Stone Base and Geotextile

**Scenario Description:**

A compacted stone road is constructed on relatively level terrain. Poor sub-base material and/or seasonal water table issues require geotextile to keep material from pumping in stone. A properly constructed, well-defined access road addresses resource concerns related to compaction, emissions of fugitive dust, and excessive sediment in surface water. Proper dust control measures are taken during construction to reduce short-term air quality deterioration. Costs include the excavation, shaping, grading, and all equipment, labor and incidental materials necessary to install the practice. Associated Practices: Critical Area Seeding (342), Diversion (362), Dust Control on Unpaved Roads and Surfaces (373), Land Clearing (460), Obstruction Removal (500), Stream Crossing (578), and Structures for Water Control (587)

**Before Situation:**

An agricultural enterprise with equipment and vehicle use has compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions from fugitive dust as a result of not having a fixed travel way. The area is relatively dry and has level terrain with stable soils.

**After Situation:**

A road is constructed 14 feet wide with an average cut of 12 inches. The entire length requires additional sub-base stabilization with geotextile and 12 inch rock base with upper zone of compacted finer grade material. Planned grades include all dips and water bars. A properly constructed, well-defined access road reduces or eliminates compaction, emissions of fugitive dust, and excess sediment in surface water by reducing the uncontrolled sediment transport and improving the drainage of irrigated lands.

**Feature Measure:** Length of Roadway

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $8,128.19

**Scenario Cost/Unit:** $27.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 467 | $663.14 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 50 | $210.50 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 16 | $1,615.04 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 50 | $45.50 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 160 | $3,980.80 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.05 | $6.35 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 560 - Access Road

**Scenario** #2 - Constructed road with Heavy Stone Base

**Scenario Description:**

A compacted stone road is constructed on relatively level terrain with no water table issues. A properly constructed, well-defined access road addresses resource concerns related to compaction, emissions of fugitive dust, and excessive sediment in surface water. Proper dust control measures are taken during construction to reduce short-term air quality deterioration. Costs include the excavation, shaping, grading, and all equipment, labor and incidental materials necessary to install the practice. Associated Practices: Critical Area Seeding (342), Diversion (362), Dust Control on Unpaved Roads and Surfaces (373), Land Clearing (460), Obstruction Removal (500), Stream Crossing (578), and Structures for Water Control (587).

**Before Situation:**

An agricultural enterprise with equipment and vehicle use has compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions from fugitive dust as a result of not having a fixed travel way. The area is relatively wet and swampy or has unstable, but level terrain.

**After Situation:**

A road is constructed 14 feet wide with an average cut of 12 inches. The entire length requires 12 inch rock base with upper zone of compacted finer grade material. Planned grades include all dips and water bars. A properly constructed, well-defined access road reduces or eliminates compaction, emissions of fugitive dust, and excess sediment in surface water by reducing the uncontrolled sediment transport and improving the drainage of irrigated lands.

**Feature Measure:** Length of Roadway

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $6,824.50

**Scenario Cost/Unit:** $22.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 40 | $168.40 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 12 | $1,211.28 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 55 | $50.05 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 160 | $3,980.80 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.05 | $6.35 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 560 - Access Road

**Scenario** #3 - Rehabilitation of Existing Road or site with solid base

**Scenario Description:**

An existing access road is repaired with 6 inches thick of compacted gravel surface. Existing road or site has a good sub-base on level terrain. A properly repaired, well-defined access road addresses resource concerns related to compaction, emissions of fugitive dust, and excessive sediment in surface water. Proper dust control measures are taken during construction to reduce short-term air quality deterioration. An average rehabilitation costs 35% less than a new installation. Costs include excavation, shaping, grading, and all equipment, labor and incidental materials necessary to install the practice. Associated Practices: Critical Area Seeding (342), Diversion (362), Dust Control on Unpaved Roads and Surfaces (373), Land Clearing (460), Obstruction Removal (500), Stream Crossing (578), and Structures for Water Control (587).

**Before Situation:**

An existing access road is beyond its useful lifespan and can no longer be used as intended without rehabilitation. If access road is left in its current condition, site will continue to degrade with continued compaction, excessive sediment in surface water, and emissions of fugitive dust.

**After Situation:**

The road will be restored to a full 14 feet width of 6 inches of compacted gravel surfaces. Minimal regarding is required. Planned grades include all dips and water bars. A properly repaired, well-defined access road reduces or eliminates compaction, emissions of fugitive dust, and excess sediment in surface water by reducing the uncontrolled sediment transport and improving the drainage of irrigated lands

**Feature Measure:** Length of Roadway

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $4,291.27

**Scenario Cost/Unit:** $14.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 78 | $328.38 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 8 | $807.52 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 78 | $1,940.64 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.05 | $6.35 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #1 - Gravel Pad on geotextile, no site prep

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with sand or quarry dust, a binder layer and then a rock base course on a geotextile fabric foundation to provide a stable, non-eroding surface. This scenario requires that site is ready for geotextile and various stone layers without any additional site preparation. Most common use will be with Animal Trail and Walkways (575) that covers the cost of site preperation, if needed. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Animal Trail and Walkway (575), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced 2,000 square feet of rock and or graveL and or sand (8 inches final thickness with 3 layers) on a geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of rock or gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $3,991.51

**Scenario Cost/Unit:** $2.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 222 | $315.24 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 3 | $62.70 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 3 | $149.43 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 13 | $394.68 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 26 | $646.88 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 38 | $2,010.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #2 - Gravel pad on geotextile with site prep

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with sand or quarry dust, a binder layer and then a rock base course on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, jncluding site preparation. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced 2,000 square feet of rock and or graveL and or sand (8 inches final thickness with 3 layers) on a geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of Rock and or Gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $4,944.48

**Scenario Cost/Unit:** $2.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 222 | $315.24 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 4 | $378.04 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 4 | $83.60 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 13 | $394.68 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 26 | $646.88 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 38 | $2,010.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #3 - Concrete Slab, reinforced with gravel foundation

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with approximately 5000 (50 x 100) square feet of 5" thick, welded wire mesh reinforced concrete and 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers
(603).

**Feature Measure:** Area of concrete

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,000.00

**Scenario Total Cost:** $37,743.45

**Scenario Cost/Unit:** $7.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 80 | $32,944.00 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 185 | $473.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 139 | $585.19 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 81 | $2,523.15 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #4 - Concrete Slab, Fiber-reinforced with No Gravel

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with fiber reinforced concrete to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with approximately 1600 (40 x 40) square feet of 6" thick non-reinforced concrete with 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers
(603).

**Feature Measure:** Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,600.00

**Scenario Total Cost:** $9,136.21

**Scenario Cost/Unit:** $5.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 30 | $76.80 |
| Concrete, CIP, Slab on Grade, fiber reinforced | 2001 | Fiber reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $287.96 | 30 | $8,638.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #5 - Concrete Slab, Fiber-reinforced with Gravel

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with approximately 1600 (40 x 40) square feet of 5" thick non-reinforced concrete with 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers
(603).

**Feature Measure:** Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,600.00

**Scenario Total Cost:** $11,656.27

**Scenario Cost/Unit:** $7.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 30 | $76.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 15 | $63.15 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| Concrete, CIP, Slab on Grade, fiber reinforced | 2001 | Fiber reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $287.96 | 30 | $8,638.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 27 | $841.05 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #6 - Concrete Slab with Curbs & Buckwall

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, including a walled section to facilitate loading accumulated wastes. The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603),Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with 2000 (50' x 40') square feet of 5" thick concrete, reinforced with welded wire mesh. The perimeter has 100 LF of 12" high by 8" thick curbs, a 40 LF section of rolled curb for access, and 50 LF of 4' high, 8" thick reinforced concrete buck wall and footer. The wall is for assisting in loading out solids collected on the lot. If area is used for storage, use 313-Waste Storage Facility. Entire site needs to be excavated, regraded, and compacted with an average fill of 2 ft. Base under concrete to be 4-6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of pad

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $32,684.41

**Scenario Cost/Unit:** $16.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 32 | $13,177.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 24 | $12,967.20 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 150 | $384.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 150 | $631.50 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 150 | $544.50 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 4 | $378.04 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 32 | $996.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #7 - Concrete Slab with Curbs, Reinforced

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with 2500 (50 x 50) square feet of 5" thick concrete, reinforeced with welded wire mesh and has 12" high by 8" thick curbs on the perimeter except for a 20' section of rolled curb for access. Entire site needs excavated, regraded and compacted with an average fill of 2'. Base under concrete to be 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of slab with curbing

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $31,341.17

**Scenario Cost/Unit:** $12.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 37 | $15,236.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 15 | $8,104.50 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 334 | $855.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 215 | $905.15 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 241 | $874.83 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 39 | $1,214.85 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #8 - Concrete slab with curb on steep site

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with concrete slab and curbs. Existing natural site grade is too steep and fill will be brought in to establish a suitable grade for concrete area and stable slopes for areas beyond the pad. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with 2500 (50 x 50) square feet of 6" thick concrete, reinforeced with welded wire mesh and has 12" high by 8" thick curbs on the perimeter except for a 20' section of rolled curb for access. Entire site needs excavated, regraded and compacted with an average fill of 5' due to steep site conditions. Base under concrete to be 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of concrete

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $36,171.62

**Scenario Cost/Unit:** $14.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 39 | $16,060.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 15 | $8,104.50 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 740 | $1,894.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 650 | $2,736.50 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 600 | $2,178.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 20 | $1,023.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 54 | $1,682.10 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 6 | $416.64 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #9 - Concrete Slab with Curb, Steep site with Retaining Wall

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with concrete slab and curbs. Existing natural site grade is too steep and /or to close to a water body. A combination of a retaining and fill will be brought in to establish a suitable grade for concrete area and stable slopes for areas beyond the pad. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with 2500 (50 x 50) square feet of 6" thick concrete, reinforeced with welded wire mesh and has 12" high by 8" thick curbs on the perimeter except for a 20' section of rolled curb for access. Entire site needs excavated, regraded and compacted with an average fill of 5' due to steep site conditions. In additon, the location prevents extending the slope downhill due to steepness or nearest to water. A 8' high retaining wall is needed on 50% of the perimeter or 100 LF. Base under concrete to be 6 inches of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of concrete

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $61,432.67

**Scenario Cost/Unit:** $24.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 39 | $16,060.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 62 | $33,498.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 400 | $1,684.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 125 | $801.25 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 600 | $2,178.00 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 6 | $895.44 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 32 | $1,712.32 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 54 | $1,682.10 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 4 | $277.76 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #10 - Fly Ash on Geotextile

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with Fly Ash on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with 1,000 square feet of Fly Ash placed in layers to a final depth of 18" on a 112 square yard of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. Water is added to hydrate and consolidate material. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of Fly Ash

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $3,042.74

**Scenario Cost/Unit:** $3.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 112 | $159.04 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 56 | $143.36 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Materials** | | | | | | |
| Fly Ash, BAB | 52 | Fly Ash, Bottom Ash Blend, includes material and delivery | Cubic Yards | $23.94 | 73 | $1,747.62 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #11 - Bituminous Concrete Pavement

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with bituminous concrete pavement on aggregate gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation. Associated Practices: Critical Area Planting (342), Herbaceous Wind Barriers (603), Sediment Basin (350), Stream Crossing (578), Waste Storage Facility (313), Waste Transfer (634), Waste Treatment (629), Watering Facility (614), and Windbreak/Shelterbelt Establishment (380).

**Before Situation:**

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with 1,000 square feet of 8" thick bituminous concrete pavement over a 6" aggregate gravel material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. Entire site needs excavated by 1' and an average fill of 2'. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of Bituminous Pavement

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $8,860.95

**Scenario Cost/Unit:** $8.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 37 | $94.72 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 75 | $480.75 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 97 | $352.11 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 19 | $591.85 |
| Asphalt, pavement | 1867 | Bituminous Concrete,includes materials, equipment and labor for 4 inch layer, base not included. | Square Feet | $2.58 | 2000 | $5,160.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #40 - Reinforced Concrete with sand or gravel foundation

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation.

**Before Situation:**

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with approximately 630 square feet of approximately 8 cubic yards of welded wire mesh reinforced concrete with 8 cubic yards of sand or gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 630.00

**Scenario Total Cost:** $3,896.92

**Scenario Cost/Unit:** $6.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 8 | $3,294.40 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4 | $10.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 8 | $242.88 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #41 - Rock/Gravel on Geotextile

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with rock and or gravel on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice, The stabilized area will address the resource concerns of soil erosion and water quality degradation.

**Before Situation:**

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with approximately 630 square feet of rock and or gravel on approximately 70 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of Rock and or Gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 630.00

**Scenario Total Cost:** $708.24

**Scenario Cost/Unit:** $1.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 70 | $99.40 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4 | $10.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 8 | $249.20 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 561 - Heavy Use Area Protection

**Scenario** #42 - Rock/Gravel-GeoCell-Geotextile

**Scenario Description:**

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with rock and or gravel in a cellular containment grid on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, vegetation of disturbed areas and labor to install this practice. The stabilized area will address the resource concerns of soil erosion and water quality degradation.

**Before Situation:**

This practice applies to all land uses where frequently and/or intensively used areas require treatment to address soil erosion and water quality degradation.

**After Situation:**

The stabilized area is surfaced with approximately 630 square feet of rock and or gravel in approximately 70 square yards of cellular containment grid on approximately 70 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All seeding or revegetation of disturbed areas is provided. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

**Feature Measure:** Area of Rock and or Gravel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 630.00

**Scenario Total Cost:** $2,437.94

**Scenario Cost/Unit:** $3.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 70 | $99.40 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4 | $10.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 8 | $249.20 |
| GeoCell, 4 inch | 1054 | 4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill | Square Yard | $24.71 | 70 | $1,729.70 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 570 - Stormwater Runoff Control

**Scenario** #1 - Silt Fence

**Scenario Description:**

This scenario involves installation of silt-fence on a construction site as part of the conservation engineering system. This practice is to control sedimentation. This practice may be part of a combined system that will address the resource concerns related with concentrated flow erosion, excessive sediment in surface waters as well as protection of existing inlets and structures depending on the combination. If earthen basins are warranted for water quality improvement purpose, use Sediment Basin (350). If seeding is warranted for water quality and erosion control purpose, use Critical Area Planting (342). If erosion control blankets, mulching, and straw are warrented they will be applied under Mulching (484). Associated practices: Sediment Basin(350), Critical Area Planting (342), and Mulching (484)

**Before Situation:**

Stormwater runoff from construction sites causes or may cause undesirable downstream flooding, sedimentation or channel degradation and/or degradation to surface or groundwater quality if left untreated.

**After Situation:**

Silt fence is installed on 25% of the perimeter (208 LF) of a 1 acre construction site to prevent sediment transport off the disturbed area. A typical silt fence consists of a synthetic filter fabric stretched between a series of fence stakes, with the stakes installed on the downstream side of the perimeter and the fabric trenched into the soil on the upstream side and backfilled. Other practices will be paid under the appropriate scenario.

**Feature Measure:** Area of construction site

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,123.84

**Scenario Cost/Unit:** $1,123.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1.5 | $37.05 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1.5 | $80.27 |
| **Materials** | | | | | | |
| Silt Fence | 43 | Silt fence with support post. Includes materials, equipment and labor | Feet | $3.29 | 208 | $684.32 |

**Practice:** 570 - Stormwater Runoff Control

**Scenario** #15 - Rain Garden

**Scenario Description:**

Typical Size: 36' x 30' area, 4-8" deep. Additional Considerations from the practice standard that would be addressed by the practice are: Design stormwater control practices to fit into the visual landscape as well as to function for runoff control. If properly designed, stormwater control practices can be beneficial to wildlife.

**Before Situation:**

Stormwater is managed to prevent erosion from farmstead impervious surfaces and practice standard is met

**After Situation:**

Stormwater is managed to prevent erosion, reduce quantity of runoff, enhance visual impact and increase wildlife habitat and/or food.

**Feature Measure:** square feet of rain garden

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,080.00

**Scenario Total Cost:** $962.27

**Scenario Cost/Unit:** $0.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 2 | $115.70 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $107.37 | 0.3 | $32.21 |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 0.1 | $44.29 |
| Perennial Grass Culms or Stems, each | 2696 | Perennial grasses used across a large area using vegetative propagules including culms or stems. Includes materials and shipping. | Each | $0.27 | 150 | $40.50 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 570 - Stormwater Runoff Control

**Scenario** #28 - Rain Garden, small scale

**Scenario Description:**

Typical Size: Drainage area 3750sqft. Garden size 20' x 30' area, 4-8" deep. Additional Considerations from the practice standard that would be addressed by the practice are: Design stormwater control practices to fit into the visual landscape as well as to function for runoff control. If properly designed, stormwater control practices can be beneficial to wildlife.

**Before Situation:**

Stormwater from farmstead impervious surfaces causes erosion and flooding

**After Situation:**

Stormwater is managed to prevent erosion, reduce quantity of runoff, enhance visual impact and increase wildlife habitat and/or food.

**Feature Measure:** sqft of rain garden

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $1,016.10

**Scenario Cost/Unit:** $1.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 4 | $231.40 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 7 | $172.90 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Mulching, straw or hay | 1214 | Use of straw or hay for temporary ground cover. Includes application and methods necessary to keep in place such as tacking or crimping. Includes materials, equipment and labor. | Acres | $3,947.23 | 0.02 | $78.94 |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 0.02 | $8.86 |
| Perennial Grass, Legume, and/or Forb Liners or Plugs, each | 2758 | Perennial grasses, legumes and/or forbs for small areas using vegetative propagules including liners or plugs. Includes materials and shipping. | Number | $1.87 | 75 | $140.25 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 572 - Spoil Disposal

**Scenario** #1 - Spoil Spreading

**Scenario Description:**

Excess soil excavated in association with another conservation practice and approved plan is spread over a designated area to reduce soil erosion and water quality degradation. Associated practices: Critical Area Planting (342)

**Before Situation:**

Excess spoil material is available from the excavation of another conservation practice (Waste Storage Facilities and lagoons, Water Transfer, Grassed Waterway, etc.) A location exists where it can be used for grading and reshaping eroding areas.

**After Situation:**

The land is shaped to the required elevations and grades to prevent or reduce erosion of sediment into waterbodies. Soil erosion and water quality resource concerns have been addressed.

**Feature Measure:** Cubic yards of spoil spread

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $2,920.00

**Scenario Cost/Unit:** $2.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 10 | $1,009.40 |
| Scraper, pull, 7 CY | 1206 | Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper. | Hours | $18.28 | 10 | $182.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 20 | $996.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 574 - Spring Development

**Scenario** #1 - Spring Development laterals

**Scenario Description:**

Develop a water source from a low yielding, diffuse flow natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing two 75 ft long, 4 inch diameter HDPE perforated pipe laterals enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (150 ft long) and behind compacted soil and plastic to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (3' diameter well casing x 8 ft long) equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,237.98

**Scenario Cost/Unit:** $6,237.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 33 | $46.86 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 16 | $851.36 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 10 | $303.60 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 20 | $623.00 |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 1500 | $150.00 |
| Pipe, PVC, 1 1/2 in., SCH 40 | 975 | Materials: - 1 1/2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.71 | 20 | $34.20 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 50 | $331.50 |
| Pipe, HDPE, 4 in., PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only. | Feet | $0.72 | 150 | $108.00 |
| Spring Collection Box Cover, steel, 4 ft. diameter | 1281 | 4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication. | Each | $283.48 | 1 | $283.48 |
| Well Casing, Concrete | 2173 | Concrete tile 3 feet diameter x 8 feet long. Materials only. | Feet | $114.02 | 8 | $912.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 574 - Spring Development

**Scenario** #2 - Spring Development no lateral

**Scenario Description:**

Develop a water source from a high yielding point source natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) at a point source natural spring or adjacent to a pond. Water seeps through back filled gravel to a perforated spring box (3' diamter well casing, 8 ft long) equipped with a watertight lid and two outlets. Compacted soil and plastic is placed below the spring box to cut off water flow. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: Livestock Pipeline (516), Watering Facility (614), Fence (382), Critical Area Planting (342); Pumping Plant (533).

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,793.10

**Scenario Cost/Unit:** $3,793.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 7 | $9.94 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 10 | $311.50 |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 100 | $10.00 |
| Pipe, PVC, 1 1/2 in., SCH 40 | 975 | Materials: - 1 1/2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $1.71 | 20 | $34.20 |
| Spring Collection Box Cover, steel, 4 ft. diameter | 1281 | 4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication. | Each | $283.48 | 1 | $283.48 |
| Well Casing, Concrete | 2173 | Concrete tile 3 feet diameter x 8 feet long. Materials only. | Feet | $114.02 | 8 | $912.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 574 - Spring Development

**Scenario** #3 - Spring Box with laterals

**Scenario Description:**

Develop a water source from a low yielding, diffuse flow natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing two 100 ft long, 4 inch diameter HDPE perforated pipe laterals enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (200 ft long) and behind compacted soil and plastic to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a concrete CIP or precast spring box with watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to a watering facility (not included) for use. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,382.23

**Scenario Cost/Unit:** $8,382.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 4 | $2,161.20 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 44 | $62.48 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 20 | $1,064.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 64 | $2,062.08 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 20 | $680.40 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 13 | $394.68 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 25 | $778.75 |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 2000 | $200.00 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 50 | $331.50 |
| Pipe, HDPE, 4 in., PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only. | Feet | $0.72 | 200 | $144.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 574 - Spring Development

**Scenario** #4 - Plastic Tank With Laterals

**Scenario Description:**

Develop a water source from a low yielding, diffuse flow natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing two 100 ft long, 4 inch diameter HDPE perforated pipe laterals enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (200 ft long) and behind compacted soil and plastic to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a plastic 1000 gal tank with watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to a watering facility (not included) for use. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,556.59

**Scenario Cost/Unit:** $6,556.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 44 | $62.48 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 16 | $851.36 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 13 | $394.68 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 25 | $778.75 |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Feet | $0.10 | 2000 | $200.00 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 50 | $331.50 |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.20 | 1000 | $1,200.00 |
| Pipe, HDPE, 4 in., PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only. | Feet | $0.72 | 200 | $144.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 574 - Spring Development

**Scenario** #12 - Spring Development

**Scenario Description:**

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long) and behind a concrete cutoff wall (6 inch x 4 ft height x 25 ft long) to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (48 inch diameter x 6 ft long CMP) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Feature Measure:** Number of Developments

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,916.58

**Scenario Cost/Unit:** $4,916.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2 | $1,080.60 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 11 | $15.62 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 16 | $851.36 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 2 | $60.72 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 2 | $62.30 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 20 | $132.60 |
| Pipe, HDPE, 4 in., PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4 inch diameter - ASTM F405. Material cost only. | Feet | $0.72 | 50 | $36.00 |
| Pipe, CMP, 48 in., 14 Gauge | 1280 | 48 inch Corrugated Metal Pipe, Galvanized, Uncoated, 14 gauge. Material cost only. | Feet | $52.60 | 6 | $315.60 |
| Spring Collection Box Cover, steel, 4 ft. diameter | 1281 | 4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication. | Each | $283.48 | 1 | $283.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 575 - Trails and Walkways

**Scenario** #1 - Walkway, earth or vegetated

**Scenario Description:**

Layout and construct an earth or vegetated trail to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide trails for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, earth and or vegetated surfaces and all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical trail will be a 12 foot wide 300 foot long, 3600 square foot lane of earth and vegetation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is 45 CY of excavation, vegetation of 1800 square foot for sufacing, 1800 square foot of earthen surfacing and vegetation of 900 square foot of disturbed areas. Consider the adequacy of natural surfacing. If the lane requires planting, the vegetation is provided. Where earth and or vegetation is not practical, adequate surface protection is provided under a different scenario. Stream Crossing, Code 578, will be used when the trail or lane crosses streams or shallow water areas. Shaping of needed water bars to control and direct water flow in the trail is part of this scenario. All culverts will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

**Feature Measure:** Area of trail

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $1,104.23

**Scenario Cost/Unit:** $0.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 4 | $378.04 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.1 | $1.32 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.1 | $0.73 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.1 | $1.23 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 3 | $3.06 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 6 | $6.06 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 6 | $3.54 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 0.2 | $21.83 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 0.04 | $1.82 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 575 - Trails and Walkways

**Scenario** #2 - Walkway, reinforced concrete

**Scenario Description:**

Layout and construct an reinforced concrete walkway on a gravel or sand foundation to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, reinforced concrete surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of reinforced concrete. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is reinforced concrete of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas along edges. The walkway consist of approximately 22 CY of excavation, 45 CY of reinforced concrete with a 45 CY gravel or sand foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

**Feature Measure:** Area of Walkway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $27,426.40

**Scenario Cost/Unit:** $7.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 58 | $23,884.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 70 | $294.70 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 6 | $440.94 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 49 | $1,487.64 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.02 | $2.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 575 - Trails and Walkways

**Scenario** #3 - Walkway with gravel, no geotextile

**Scenario Description:**

Layout and construct a walkway with rock and or gravel on solid earthen foundation for surface treatment, to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, rock and or gravel, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of rock and or gravel on a geotextile fabric foundation surface treatment. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is aggregrate gravel of 3600 square foot for surfacing, and vegetation of 900 square foot of disturbed areas along edges. The walkway consist of approximately 22 CY of excavation, 45 CY of aggregrate gravel on a 400 SY of geotextile fabric foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

**Feature Measure:** Area of Walkway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $7,282.39

**Scenario Cost/Unit:** $2.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 4 | $378.04 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.1 | $0.73 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 0.1 | $1.19 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.1 | $1.23 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 4 | $83.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 23 | $698.28 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 45 | $1,401.75 |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 6 | $6.12 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 3 | $3.03 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 3 | $1.77 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 0.2 | $21.83 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 67 | $3,544.97 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.02 | $2.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 575 - Trails and Walkways

**Scenario** #4 - Walkway with Gravel and Geotextile

**Scenario Description:**

Layout and construct a walkway with rock and or gravel on a geotextile fabric foundation surface treatment, to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, rock and or gravel, geotextile, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of rock and or gravel on a geotextile fabric foundation surface treatment. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is aggregrate gravel of 3600 square foot for surfacing, and vegetation of 900 square foot of disturbed areas along edges. The walkway consist of approximately 22 CY of excavation, 45 CY of aggregrate gravel on a 400 SY of geotextile fabric foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

**Feature Measure:** Area of Walkway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $8,280.45

**Scenario Cost/Unit:** $2.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 400 | $568.00 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 6 | $567.06 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.1 | $0.73 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 0.1 | $1.19 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.1 | $1.23 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34 inch roller. Equipment cost only. Does not include labor. | Hours | $20.90 | 6 | $125.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 23 | $698.28 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 45 | $1,401.75 |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 6 | $6.12 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 3 | $3.03 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 3 | $1.77 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 0.2 | $21.83 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 67 | $3,544.97 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.02 | $2.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 575 - Trails and Walkways

**Scenario** #5 - Walkway with Rock/Gravel in GeoCell on Geotextile

**Scenario Description:**

Layout and construct a walkway with rock and or gravel in a cellular containment grid on a geotextile fabric foundation surface treatment, to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, rock and or gravel, containment grid, geotextile, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of rock and or gravel in a cellular containment grid on a geotextile fabric foundation surface treatment. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is aggregate gravel of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 45 CY of aggregate gravel in 400 SY of 4 inch geocell on a 400 SY of geotextile fabric foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal
movement.

**Feature Measure:** Area of Walkway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $13,238.54

**Scenario Cost/Unit:** $3.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 400 | $568.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 2 | $115.70 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 0.1 | $1.19 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.1 | $1.23 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 45 | $1,401.75 |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 6 | $6.12 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 3 | $3.03 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 3 | $1.77 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 0.2 | $21.83 |
| GeoCell, 4 inch | 1054 | 4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill | Square Yard | $24.71 | 400 | $9,884.00 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.02 | $2.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 575 - Trails and Walkways

**Scenario** #6 - Walkway with Fly Ash on Geotextile

**Scenario Description:**

Layout and construct a walkway with Fly Ash on a geotextile fabric foundation surface treatment, to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, Fly Ash, geotextile, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of Fly Ash on a geotextile fabric foundation surface treatment. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is Fly Ash of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 45 CY of Fly Ash on a 400 SY of geotextile fabric foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

**Feature Measure:** Area of Walkway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $2,847.72

**Scenario Cost/Unit:** $0.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 400 | $568.00 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 22 | $56.32 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 3 | $302.82 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 3 | $149.43 |
| **Materials** | | | | | | |
| Fly Ash, BAB | 52 | Fly Ash, Bottom Ash Blend, includes material and delivery | Cubic Yards | $23.94 | 45 | $1,077.30 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.02 | $2.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 575 - Trails and Walkways

**Scenario** #7 - Walkway, Bituminous Concrete Pavement

**Scenario Description:**

Layout and construct a bituminous concrete pavement surface treatment on aggregate gravel foundation walkway to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, bituminous concrete pavement surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of bituminous concrete pavement on aggregate gravel foundation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is bituminous concrete pavement of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 3600 square feet bituminous concrete pavement, with a 45 CY gravel foundation. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

**Feature Measure:** Area of Walkway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $11,892.17

**Scenario Cost/Unit:** $3.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 22 | $56.32 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 3 | $302.82 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 3 | $149.43 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 45 | $1,401.75 |
| Asphalt, pavement | 1867 | Bituminous Concrete,includes materials, equipment and labor for 4 inch layer, base not included. | Square Feet | $2.58 | 3600 | $9,288.00 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.02 | $2.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 575 - Trails and Walkways

**Scenario** #8 - Walkway, Wood Chips

**Scenario Description:**

Layout and construct a wood chip surface treatment on a earthen foundation walkway to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource conerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, wood chip surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical walkway will be a 12 foot wide 300 foot long, 3600 square foot of wood chip srface treatment on earthen foundation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is wood chips of 3600 square foot for sufacing, and vegetation of 900 square foot of disturbed areas. The walkway consist of approximately 22 CY of excavation, 3600 square feet of wood chip surfacing. Stream Crossing, Code 578, will be used when the walkway crosses streams or shallow water areas. All culvets will be applied under Structure for Water Control (587). Use Access Road, Code 560 and Diversion (362) as appropriate. Fencing, Code 382, will be used when needed to control animal movement.

**Feature Measure:** Area of Walkway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,600.00

**Scenario Total Cost:** $3,374.45

**Scenario Cost/Unit:** $0.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 22 | $56.32 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 3 | $220.47 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 45 | $2,541.15 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 575 - Trails and Walkways

**Scenario** #44 - Wood Chips, Walkway small scale

**Scenario Description:**

Layout and construct a wood chip surface treatment on a earthen foundation walkway to facilitate the movement of animals, people, or small off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource concerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, wood chip surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

**Before Situation:**

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by small off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

**After Situation:**

The typical walkway will be a 6 foot widex100 foot longx4" thick , 600 square foot of wood chip surface treatment on earthen foundation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is wood chips of 600 square foot for surfacing.

**Feature Measure:** sqft of walkway

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $1,302.84

**Scenario Cost/Unit:** $2.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 7 | $172.90 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 8 | $451.76 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 15 | $483.30 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 67 | $141.37 |

**Practice:** 576 - Livestock Shelter Structure

**Scenario** #5 - Prefabricated Portable Shade Structure

**Scenario Description:**

A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 10 ft x 20 ft prefab portable structure. Associated practices include Fence (382), Prescribed Grazing (528), and Watering Facility (614).

**Before Situation:**

Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

**After Situation:**

Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

**Feature Measure:** Area of Roof Frame

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $1,494.76

**Scenario Cost/Unit:** $7.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 9 | $222.30 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 11 | $354.42 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| High Tunnel, Quonset style, Variable Cost | 2790 | Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only. | Square Feet | $3.52 | 200 | $704.00 |

**Practice:** 576 - Livestock Shelter Structure

**Scenario** #6 - Portable Shade Structure

**Scenario Description:**

A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 25 ft x 40 ft portable structure. Associated practices include Fence (382), Prescribed Grazing (528), and Watering Facility (614).

**Before Situation:**

Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

**After Situation:**

Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

**Feature Measure:** Area of Roof Frame

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $5,884.39

**Scenario Cost/Unit:** $5.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Portable Welder | 1407 | Portable field welder. Equipment only. Labor not included. | Hours | $20.21 | 16 | $323.36 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 25 | $56.25 |
| Steel, Plate, 3/16 in. | 1048 | Flat Steel Plate, 3/16 inch thick, materials only. | Square Feet | $10.79 | 2 | $21.58 |
| Pipe, Steel, 1 1/4 in., SCH 40 | 1103 | Materials: - 1 1/4 inch - Steel SCH 40 | Feet | $5.86 | 94 | $550.84 |
| Pipe, Steel, 2 in., SCH 40 | 1105 | Materials: - 2 inch - Steel SCH 40 | Feet | $9.40 | 185 | $1,739.00 |
| Synthetic Liner, 60 mil | 2109 | Synthetic 60 mil HDPE, LLDPE, EPDM, etc. membrane liner material. Includes materials and shipping only. | Square Feet | $1.85 | 1000 | $1,850.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 576 - Livestock Shelter Structure

**Scenario** #7 - Portable Fabricated Wind Shelter, equal to or greater than 8 foot

**Scenario Description:**

Portable Livestock Fabricated Wind Shelter is installed to provde protection for livestock. The shetler can be moved aroung the grazing unit in order to prevent heavy use resource concerns at any one location.

**Before Situation:**

Herds are held and fed in fragile riparian areas in order to reduce stress on domestic animals from harsh winter conditions and provide protection from wind. The concentration of animals in these areas degrade streambanks, cause excessive sedimentation, damage woody vegetation, overgraze herbacious vegetation, in addition to degrading water quality through manure deposition and erosion. Resouce concerns are water quality, animal health, plant productivity, health, and vigor, and inadequate shelter.

**After Situation:**

Portable fabricated wind shelters are utilized to provide shelter for livestock in upland grazing areas from the riparian zones. The portable shelters are moved in rotation with feeding areas thereby limiting soil disturbance and reducing the impacts of heavy use at any one location. As a result of implementing this practice, the herd can be moved out of the impacted area and water quality and vegetation health resource concerns will be addressed. A typical portable wind shelter involves a series of steel framed panels faced with corrugated metal. Each unit is approximately 9.5 feet tall and 24 feet long. Four panels (96 - feet) would be utilized to provide shelter to a herd size of 125 animals.

**Feature Measure:** Length of Wind Shelter

**Scenario Unit:** Feet

**Scenario Typical Size:** 96.00

**Scenario Total Cost:** $5,311.44

**Scenario Cost/Unit:** $55.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| **Materials** | | | | | | |
| Corrugated Steel, 22 gauge | 224 | Corrugated or ribbed, galvanized, 22 gauge, includes fasteners, materials only. | Square Feet | $2.52 | 864 | $2,177.28 |
| Drill Stem, steel, used | 1393 | Used drill stem typically 2-3/8 or 2-7/8 inch diameter. Materials only. | Feet | $2.62 | 380 | $995.60 |

**Practice:** 576 - Livestock Shelter Structure

**Scenario** #8 - Permanent Fabricated Wind Shelter, equal to or greater than 8 foot

**Scenario Description:**

Permanent Livestock Fabricated Wind Shelter is installed to provde protection for livestock.

**Before Situation:**

Herds are held and fed in fragile riparian areas in order to reduce stress on domestic animals from harsh winter conditions and provide protection from wind. The concentration of animals in these areas degrade streambanks, cause excessive sedimentation, damage woody vegetation, overgraze herbacious vegetation, in addition to degrading water quality through manure deposition and erosion. Resouce concerns are water quality, animal health, plant productivity, health, and vigor, and inadequate shelter.

**After Situation:**

Permanent fabricated wind shelters are installed in order to provide shelter for livestock in upland grazing areas away from the riparian zones. As a result, animals can be held in an area away from the riparian zone thereby eliminating the impacts to water quality and riparian health. A typical scenario is a Fabricated Wind Shelter installed in association with an animal feeding operation (AFO). The AFO has been moved out of the riparian zone where shelter was previously provided by the surrounding riparian woody vegetation. The AFO has been moved to a location where shelter is not naturally provided and needs to be fabricated. The typical fabrication involves a permanent, wood framed, metal or wood faced, 8.5 - foot high, 200 - foot long, fabricated wind shelter, 80% solid face, secured to the ground with wood posts.

**Feature Measure:** Length of Wind Shelter

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $9,178.27

**Scenario Cost/Unit:** $45.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 16 | $851.36 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| **Materials** | | | | | | |
| Post, Wood, CCA treated, 6 in. x 12-14 ft. | 13 | Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only. | Each | $39.56 | 26 | $1,028.56 |
| Corrugated Steel, 22 gauge | 224 | Corrugated or ribbed, galvanized, 22 gauge, includes fasteners, materials only. | Square Feet | $2.52 | 1360 | $3,427.20 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 800 | $1,912.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 578 - Stream Crossing

**Scenario** #1 - Bridge

**Scenario Description:**

Install a bridge to allow stream flows to cross under access road or animal trail. Bridge opening determined by sizing for storm event dictated in standard. Scenario includes dewatering, abutments, girders, decking. Work consists of site preparation, dewatering, acquiring and installing abuttments, girders, decking with necessary hardware, backfilling abuttments, and armoring with geotextile and riprap. Riprap and geotextile are used to stabilize and protect abutments as needed. Scenario based on cast in place concrete abutments, steel girders, and timber deck. Travel surface shall be wooden deck surface. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Span is 30 feet. Load is H-20. Width is 12 feet including curbs. Abutments are <= 6 feet. Use this option assumes permits require extensive stream diversion or pumping bypass during construction.Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization,(561)Heavy Use Area,(382) Fence.

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

Access and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross.

**Feature Measure:** square footage of bridge deck

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 360.00

**Scenario Total Cost:** $28,416.62

**Scenario Cost/Unit:** $78.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 16 | $851.36 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 8 | $842.24 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 75 | $120.75 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 80 | $4,092.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 20 | $996.20 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 20 | $2,935.40 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 20 | $623.00 |
| Dimension Lumber, untreated | 1045 | Untreated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners. | Board Feet | $2.08 | 2000 | $4,160.00 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yards | $121.17 | 18 | $2,181.06 |
| Steel, structural steel members | 1779 | Structural steel, includes materials and fabrication. | Pound | $2.27 | 4500 | $10,215.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 578 - Stream Crossing

**Scenario** #2 - Culvert installation

**Scenario Description:**

Install a new culvert. Work includes dewatering, site preparation and removing any old crossing, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. 36 inch Culvert installation with <75 cy of fill needed and < 2 yds rock riprap for headwalls. Pipe is 40 feet long. Use of this option assumes permits require extensive stream diversion or pumping bypass during construction.Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization. (561) Heavy Use Area, (382)Fence

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

Access road and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Typical crossing is 36" diameter pipe by 40 foot long. Practice payment based on diameter in inches times the length of pipe in feet.

**Feature Measure:** Culvert, inches diameter x length o

**Scenario Unit:** Inch-Foot

**Scenario Typical Size:** 1,440.00

**Scenario Total Cost:** $20,123.78

**Scenario Cost/Unit:** $13.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 18 | $115.38 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 10 | $1,251.10 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 20 | $8,540.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 20 | $996.20 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 27 | $3,962.79 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 50 | $1,557.50 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 36 in. | 1248 | Pipe, Corrugated HDPE Double Wall, 36 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $57.54 | 40 | $2,301.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 578 - Stream Crossing

**Scenario** #3 - Ford with Water Management

**Scenario Description:**

To install a stable crossing medium on channel bottom and approaches. Medium includes but not limited to precast concrete blocks, geocells, pavers, and gabions. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Typical stream has 30 foot bottom width and approaches. Width is 12 feet for a total area as 420sf with total at 600sf. Use this option if permits require extensive stream diversion or pumping bypass during construction. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Scenario does not include cattle slats. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization, (561) Heavy Use Area,(382) Fence,

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

Access road and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross.

**Feature Measure:** low water crossing

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 600.00

**Scenario Total Cost:** $16,906.30

**Scenario Cost/Unit:** $28.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 16 | $1,175.84 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 20 | $8,540.40 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 2 | $210.56 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 18 | $28.98 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 20 | $2,935.40 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 6 | $182.16 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 18 | $560.70 |
| GeoCell, 4 inch | 1054 | 4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill | Square Yard | $24.71 | 50 | $1,235.50 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yards | $121.17 | 1.2 | $145.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 578 - Stream Crossing

**Scenario** #4 - Ramp only

**Scenario Description:**

Install a stable ramp for a channel crossing with a stable bottom. Medium includes but not limited to precast concrete blocks, geocells, pavers, and rip rap. Cattle slats are found under a seperate scenario. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Approach stabilization paid by associated practices. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization, (561) Heavy Use Area,(382) Fence,

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

A 12' Wide ramp is installed at a 5:1 slope on a 4' bank height for a total area of 240 SF per approach or 480 SF total. Access road, animal trails and walkway, heavy use area and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Payment measured from top of ramp to toe of slope times design width using low bank to set top of ramp. Areas above this that need stabilization paid under associated practices.

**Feature Measure:** Square foor of approach

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 480.00

**Scenario Total Cost:** $6,993.58

**Scenario Cost/Unit:** $14.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 6 | $798.30 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 6 | $347.10 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 6 | $631.68 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 23 | $3,375.71 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 6 | $182.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 578 - Stream Crossing

**Scenario** #5 - Ramps and channel

**Scenario Description:**

Install a stable ramp and stabilize bottom for a channel crossing with an unstable bottom. Medium includes but not limited to precast concrete blocks, geocells, pavers, and rip rap. Cattle slats are found under a separate scenario. If a different travel surface is needed, refer to another appropriate standard for the surfacing. State permits have minimal requirements for water management during installation. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Approach stabilization paid by associated practices. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization, (561) Heavy Use Area,(382) Fence,

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

A 12' Wide ramp is installed at a 5:1 slope on a 4' bank height for a total area of 240 SF per approach or 480 SF total for ramps. In addition, a 30' long bottom is also stabilized for an additional 360 SF or a total of 840 SF. Access road, animal trails and walkway, heavy use area and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Payment measured from top of ramp to toe of slope times design width using low bank to set top of ramp plus the with of the channel bottom times the width. Areas above this that need stabilization paid under associated practices.

**Feature Measure:** SF of total crossing

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 840.00

**Scenario Total Cost:** $9,123.01

**Scenario Cost/Unit:** $10.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 12 | $1,501.32 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 4 | $215.12 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 12 | $408.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 31 | $4,549.87 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 8 | $242.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 578 - Stream Crossing

**Scenario** #6 - Ramp only with Cattle Slats

**Scenario Description:**

Install a stable ramp for a channel crossing with a stable bottom. Medium limited to precast concrete cattle or hog slats laid over a subbase with stone to protect the side slopes. If a different travel surface is needed, use Ramp only option for the surfacing. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Approach stabilization paid by associated practices. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization, (561) Heavy Use Area,(382) Fence,

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

A 12' Wide ramp is installed at a 5:1 slope on a 4' bank height for a total area of 240 SF per approach or 480 SF total. Access road, animal trails and walkway, heavy use area and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Payment measured from top of ramp to toe of slope times design width using low bank to set top of ramp. Areas above this that need stabilization paid under associated practices.

**Feature Measure:** Square foor of approach

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 480.00

**Scenario Total Cost:** $8,100.83

**Scenario Cost/Unit:** $16.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 4 | $358.88 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 4 | $215.12 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 23 | $3,375.71 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 6 | $186.90 |
| Cattle Slats | 2553 | Cattle/Hog slats (new, used or seconds) or Stream Crossing Slats palced in streams needed to prevent injury to cattle by creating stable footing. Includes materials only. | Square Feet | $6.35 | 480 | $3,048.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 578 - Stream Crossing

**Scenario** #7 - Ramps and channel with Cattle Slats

**Scenario Description:**

Install a stable ramp and stabililize bottom for a channel crossing with an unstable bottom. Medium limited to precast concrete cattle or hog slats laid over a stone subbase with riprap to protect the side slopes. If a different travel surface is needed, use Ramp and channel option for the surfacing. State permits have minimal requirements for water management during installation. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Approach stabilization paid by associated practices. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization, (561) Heavy Use Area,(382) Fence,

**Before Situation:**

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

**After Situation:**

A 12' Wide ramp is installed at a 5:1 slope on a 4' bank height for a total area of 240 SF per approach or 480 SF total for ramps. In addition, a 30' long bottom is also stabilized for an additional 360 SF or a total of 840 SF. But to purchase an even number of slats use 864 SF. Access road, animal trails and walkway, heavy use area and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Payment measured from top of ramp to toe of slope times design width using low bank to set top of ramp plus the with of the channel bottom times the width. Areas above this that need stabilization paid under associated practices.

**Feature Measure:** SF of total crossing

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 864.00

**Scenario Total Cost:** $16,357.56

**Scenario Cost/Unit:** $18.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 12 | $1,596.60 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 10 | $578.50 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 10 | $1,052.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 20 | $680.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 23 | $3,375.71 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 8 | $242.88 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 39 | $1,214.85 |
| Cattle Slats | 2553 | Cattle/Hog slats (new, used or seconds) or Stream Crossing Slats palced in streams needed to prevent injury to cattle by creating stable footing. Includes materials only. | Square Feet | $6.35 | 864 | $5,486.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario** #1 - Vegetative

**Scenario Description:**

Protection of streambanks consisting of conventional plantings of vegetation to stabilize and protect against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation and erosion control fabric; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484 - Mulching

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has marginally degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Square Feet of Streambank/Shoreli

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 20,000.00

**Scenario Total Cost:** $20,758.21

**Scenario Cost/Unit:** $1.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 2500 | $6,400.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 32 | $2,351.68 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.46 | $5.64 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 224 | $7,217.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 32 | $1,088.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 56 | $2,996.56 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.46 | $26.33 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario** #2 - Bioengineered

**Scenario Description:**

Protection of streambanks consisting of a bioengineered technique comprised of non-structural measures such as earth revetments and benches with vegetative measures to stabilize and protect the streambank against scour and erosion. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brushmattresses, live stakes, joint plantings, vegetated geogrids, branchpacking, and live fascines. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, livestake, rootwads and revetments: a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility;484 - Mulching; 570 - Stormwater runoff control

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has moderately degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Square Feet of Streambank/Shoreli

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 20,000.00

**Scenario Total Cost:** $37,432.56

**Scenario Cost/Unit:** $1.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 2500 | $6,400.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 16 | $1,175.84 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 32 | $2,871.04 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.46 | $5.64 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 384 | $12,372.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 48 | $1,632.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 32 | $1,593.92 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 80 | $4,280.80 |
| **Materials** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 5000 | $6,150.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.46 | $26.33 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario** #3 - Structural, >5 ft bank

**Scenario Description:**

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484 - Mulching; 570 - Stormwater runoff control

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Cubic Yards of Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,667.00

**Scenario Total Cost:** $345,293.00

**Scenario Cost/Unit:** $207.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2500 | $10,525.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 48 | $3,527.52 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 33 | $4,128.63 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.12 | $1.47 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 60 | $25,621.20 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.79 | 3500 | $16,765.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 352 | $11,341.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 48 | $2,390.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 80 | $4,280.80 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1667 | $244,665.59 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 5280 | $4,118.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.46 | $26.33 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 17000 | $17,000.00 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario** #4 - Structural small, banks less than 4 ft

**Scenario Description:**

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 4-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.21 acres) is used for estimation purposes. The rock toe will be 2' thick and 3' high. The bank above the riprap will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484 - Mulching; 570 - Stormwater runoff control

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Cubic Yards of Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 800.00

**Scenario Total Cost:** $167,958.89

**Scenario Cost/Unit:** $209.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1750 | $7,367.50 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 24 | $1,763.76 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.21 | $2.58 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 30 | $12,810.60 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.79 | 1750 | $8,382.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 224 | $7,217.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 800 | $117,416.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.21 | $12.02 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 8160 | $8,160.00 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario** #5 - Geotextile Wrapped

**Scenario Description:**

Protection of streambanks using geotextile wrapped soil lifts and native vegetation. Coir fabric and coir logs are placed on the constructed bench to form the bankline. The coir logs are then tied into the existing bankline at either end. The soil lifts include a woven inner fabric that helps prevent fine sediments from washing out and a heavier outer fabric that provides structural support. The structure is filled with soil to the height of the coir log. Coir fabric is then pulled over the coir log and soil and wooden wedge stakes are placed to secure the fabric along the back edge. Soil and willow cuttings are placed between the lift layers and the process is repeated. Willow cuttings are placed on the top lift and a final layer of soil is placed to the height of the bank. The top layer is then seeded with a mix of native grasses and forbs. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484 - Mulching; 570 - Stormwater runoff control

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Square Foot of Streambank

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,500.00

**Scenario Total Cost:** $71,347.72

**Scenario Cost/Unit:** $47.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 2923 | $7,482.88 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2923 | $12,305.83 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 193 | $700.59 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 32 | $4,003.52 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.25 | $3.07 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 64 | $2,062.08 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 32 | $1,593.92 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 30 | $934.50 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 462 | $24,444.42 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 2350 | $4,958.50 |
| Mulching, straw or hay | 1214 | Use of straw or hay for temporary ground cover. Includes application and methods necessary to keep in place such as tacking or crimping. Includes materials, equipment and labor. | Acres | $3,947.23 | 0.25 | $986.81 |
| Tree & Shrub, Woody, Cuttings, Medium | 1308 | Woody cuttings, live stakes or whips typically 1/4 to 1 inch diameter and 24 to 48 inches long. Includes materials and shipping only. | Each | $1.67 | 6300 | $10,521.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.25 | $14.31 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario** #15 - Bioengineered with Toe Protection

**Scenario Description:**

Protection of streambanks consisting of a bioengineered technique comprised of non-structural measures such as earth revetments and benches with vegetative measures to stabilize and protect the streambank against scour and erosion. Scenario consists of rock rip rap for toe protection in combination with bioengineering techniques. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brushmattresses, live stakes, joint plantings, vegetated geogrids, branchpacking, and live fascines. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, livestake, rootwads and revetments: a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility;484 - Mulching; 570 - Stormwater runoff control

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has moderately degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Square Feet of Streambank/Shoreli

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 20,000.00

**Scenario Total Cost:** $130,005.08

**Scenario Cost/Unit:** $6.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 2000 | $5,120.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 32 | $2,351.68 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 32 | $2,871.04 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.35 | $4.29 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 30 | $12,810.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 128 | $4,124.16 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 32 | $1,088.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 32 | $1,593.92 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 556 | $81,604.12 |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.70 | 1667 | $2,833.90 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 3750 | $4,612.50 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.31 | $17.74 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 8160 | $8,160.00 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario** #19 - Rock Structure, Deflector or Cross Vane

**Scenario Description:**

This scenario describes the implementation of streambank protection to stabilize an eroded stream bank and provide instream habitat. This scenario involves placement of a rock structure, such as a deflector or cross vane, into a stream to redirect flow away from a bank and toward the center of the channel. An evaluation of the stream bank erosion issues should be conducted to determine whether the problem is localized or the result of larger scale factors that would require more complex treatment methods. Localized causes are addressed with implementation of this practice in combination with other practices that establish vegetation and exclude livestock access to the stream and adjacent riparian area. This scenario is appropriate where livestock exclusion alone is insufficient to provide sufficient stability for the establishment of appropriate vegetation. This practice may be implemented as part of a stream corridor restoration system. Associated Practices: Aquatic Organism Passage (396), Critical Area Planting (342), Fence (382), Mulching (484), Riparian Forest Buffer (391), Riparian Herbaceous Cover (390), Stream Habitat Improvement and Management (395)

**Before Situation:**

A streambank is eroded due to livestock presence and/or lack of appropriate vegetation. Stream flow continues to erode bank and cause undercutting and slumping, releasing sediment into the stream. Sediment carried downstream degrades water quality and aquatic habitat.

**After Situation:**

Flow is redirected away from the eroded streambank toward the center of the channel. The stream bank and riparian area above the structure are planted to appropriate vegetation using other practices. With stream flow energy directed away from the bank, planted vegetation has sufficient time to establish and provide additional bank stability and habitat.

**Feature Measure:** Each Structure

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,572.86

**Scenario Cost/Unit:** $7,572.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 4 | $500.44 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 1 | $57.85 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 8 | $3,416.16 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included. | Ton | $52.91 | 20 | $1,058.20 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 17 | $1,521.84 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 580 - Streambank and Shoreline Protection

**Scenario** #28 - Structural

**Scenario Description:**

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

**Before Situation:**

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

**After Situation:**

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

**Feature Measure:** Linear Feet of Streambank/Shorelin

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $288,065.26

**Scenario Cost/Unit:** $288.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 2500 | $10,525.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 16 | $1,175.84 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.12 | $1.47 |
| Excavation, common earth, wet, side cast, large equipment | 1228 | Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $4.79 | 2500 | $11,975.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 360 | $11,599.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 90 | $4,815.90 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1667 | $244,665.59 |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.70 | 556 | $945.20 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 25 | $917.00 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 582 - Open Channel

**Scenario** #9 - excavation, normal conditions

**Scenario Description:**

This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are 6' deep x 15' wide bottom x 100' length with a side slope of 2.5:1. The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Conditions are normal. Normal conditions include: a location easily accessible from a main road, soils without large rock or difficult clay to excavate, and/or other aspects that are average compared to excavation work in the area.This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 356-Dike, 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

**Before Situation:**

A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

**After Situation:**

An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Flooding and erosion is no longer a resource concern.

**Feature Measure:** Volume of earth excavated in CY's

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $1,531.47

**Scenario Cost/Unit:** $3.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 500 | $1,280.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 582 - Open Channel

**Scenario** #10 - excavation, difficult conditions

**Scenario Description:**

This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are 6' deep x 15' wide bottom x 100' length with a side slope of 2.5:1. The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Conditions are difficult. Difficult conditions include: a location that requires a significant drive off the main road, soils with large rock or difficult clay to excavate, and/or other aspects that create difficulty in excavation compared to similar work in the area. Construction may include vegetation and/or a lightly armored bank toe. This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 356-Dike, 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

**Before Situation:**

A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

**After Situation:**

An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Flooding and erosion is no longer a resource concern.

**Feature Measure:** Volume of earth excavated in CY's

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $2,217.31

**Scenario Cost/Unit:** $4.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 500 | $1,280.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 582 - Open Channel

**Scenario** #11 - excavation and fill, normal conditions

**Scenario Description:**

This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are 6' deep x 15' wide bottom x 100' length with a side slope of 2.5:1. Excavation and earth fill is required. The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Conditions are normal. Normal conditions include: a location easily accessible from a main road, soils without large rock or difficult clay to excavate, and/or other aspects that are average compared to excavation work in the area. This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 356-Dike, 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

**Before Situation:**

A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

**After Situation:**

An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Some fill was used to complete the channel shape. Flooding and erosion is no longer a resource concern.

**Feature Measure:** Volume of earth excavated in CY's

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $3,636.47

**Scenario Cost/Unit:** $7.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 500 | $1,280.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 500 | $2,105.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 582 - Open Channel

**Scenario** #12 - excavation and fill, difficult conditions

**Scenario Description:**

This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are 6' deep x 15' wide bottom x 100' length with a side slope of 2.5:1. The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Excavation and earth fill is required. Conditions are difficult. Difficult conditions include: a location that requires a significant drive off the main road, soils with large rock or difficult clay to excavate, and/or other aspects that create difficulty in excavation compared to similar work in the area. Construction may include vegetation and/or a lightly armored bank toe. This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 356-Dike, 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

**Before Situation:**

A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

**After Situation:**

An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Some fill was used to complete the channel shape. Flooding and erosion is no longer a resource concern.

**Feature Measure:** Volume of earth excavated in CY's

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $4,322.31

**Scenario Cost/Unit:** $8.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 500 | $1,280.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 500 | $2,105.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 584 - Channel Bed Stabilization

**Scenario** #1 - Bioengineering

**Scenario Description:**

The bottom and slope of a stream channel is stabilized using bioengineering methods. Bio-engineering methods include live stakes, fascines, plantings, bare-root stock, willow waddles, and live stakes. Re-vegetation of exposed surfaces is completed using Critical Area Planting (342). The typical stream has a 50 foot bottom width and 6 foot banks. The length stabilized is around 100 feet. The entire area is planted at a 2 x 2 grid with live stakes, potted plants, and a bare root mix. Associated practices: (326) Clearing and Snagging, (396 ) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control

**Before Situation:**

An existing or newly constructed alluvial bed or threshold channel is accumulating sediment (aggrading) or eroding. The stream channel is unstable causing soil erosion, water quality degradation, excessive sediment, and inadequate habitat for fish and wildlife.

**After Situation:**

The stream channel is stabilized and vegetated using bio-engineering methods. Bio-engineering methods include live stakes, fascines, plantings, bare-root stock, willow waddles, and live stakes. The sediment load is decreased and aquatic habitat improved. The water conveyance capacity, storage capacity and flow within the stream are stabilized.

**Feature Measure:** Area of planting

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $13,657.23

**Scenario Cost/Unit:** $5.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 40 | $1,083.20 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 200 | $182.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 40 | $1,360.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.70 | 800 | $1,360.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 1500 | $1,845.00 |
| Wattles or fascines, 6 to 8 inch diameter | 1904 | Fascines, or wattles: bundles of live tree stems of species that sprout roots, bound together, 6-8 inch diameter. Includes materials and shipping only. | Feet | $9.08 | 200 | $1,816.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 0.06 | $3.43 |

**Practice:** 584 - Channel Bed Stabilization

**Scenario** #2 - Rock structures

**Scenario Description:**

The bottom and slope of a stream channel is stabilized using rock rip-rap or engineered products of rock or concrete. Engineered products include, but are not limited to, gabions, rock veins, rock weirs, and concrete blocks. The typical stream has a 50 foot bottom width and 6 foot banks. The stabilized length is 100 feet. Associated practices: (326) Clearing and Snagging, (396 ) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control.

**Before Situation:**

An existing or newly constructed alluvial bed or threshold channel is accumulating sediment (aggrading) or eroding. The stream channel is unstable causing soil erosion, water quality degradation, excessive sediment, and inadequate habitat for fish and wildlife. The channel cannot be feasibly stabilized with clearing and snagging, vegetation, bank protection or upstream water control.

**After Situation:**

The stream channel is stabilized using rock rip-rap and engineered products. Engineered products include, but are not limited to, gabions, rock veins, rock weirs, and concrete blocks. The sediment load is decreased and aquatic habitat improved. The water conveyance capacity, storage capacity and flow within the stream are stabilized.

**Feature Measure:** Area to be stabilized.

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 575.00

**Scenario Total Cost:** $89,268.71

**Scenario Cost/Unit:** $155.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 0.2 | $64.84 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 600 | $88,062.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 200 | $246.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 584 - Channel Bed Stabilization

**Scenario** #3 - Wood structures

**Scenario Description:**

The bottom and slope of a stream channel is stabilized using engineered wood structures. Structures include, but are not limited to, toe wood, log weirs, log vanes, root wads, and log step pools. Structures are typically spaced at 50 foot intervals. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. The typical stream has a 50 foot bottom width and 6 foot banks. The stabilized length is 100 feet. Associated practices: (342) Critical Area Planting, (326) Clearing and Snagging, (396 ) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control.

**Before Situation:**

An existing or newly constructed alluvial bed or threshold channel is accumulating sediment (aggrading) or eroding. The stream channel is unstable causing soil erosion, water quality degradation, excessive sediment, and inadequate habitat for fish and wildlife. The channel cannot be feasibly stabilized with clearing and snagging, vegetation, bank protection or upstream water control.

**After Situation:**

The stream channel is stabilized using engineered wood structures. Structures include, but are not limited to, toe wood, log weirs, log vanes, root wads, and log step pools. The sediment load is decreased and aquatic habitat improved. The water conveyance capacity, storage capacity and flow within the stream are stabilized.

**Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $14,329.45

**Scenario Cost/Unit:** $4,776.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 40 | $102.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 75 | $11,007.75 |
| Wattles or fascines, 9 to 12 inch diameter | 1905 | Fascines, or wattles: bundles of live tree stems of species that sprout roots, bound together, 9-12 inch diameter. Includes materials and shipping only. | Feet | $12.87 | 150 | $1,930.50 |

**Practice:** 585 - Stripcropping

**Scenario** #1 - Stripcropping - wind and water erosion

**Scenario Description:**

This scenario describes the implementation of a strip cropping system that is designed specifically for the control of wind and water erosion or minimizing the transport of sediments or other water borne contaminants originating from runoff on cropland. The planned strip cropping system will meet the current 585 standard. Implementation will result in alternating strips of erosion susceptible crops with erosion resistant crops that are oriented as close to perpendicular to water flows as possible. The designed system will reduce erosion/sediment/contaminants to desired objectives. The scenario includes the costs of designing the system, installing the strips on the landscape appropriately, and integrating a crop rotation that includes water erosion resistant species.

**Before Situation:**

In this geographic area, excessive water erosion is caused by raising crops in a manner that allows sheet water flows to travel down the slope causing sheet and rill erosion or concentrated flow conditions, degradation of soil health through loss of topsoil and organic matter, along with offsite negative impacts to water quality and aquatic wildlife habitat.

**After Situation:**

A strip cropping system that includes at least two or more strips within the planning slope will be designed to include parallel strips of approximately equal widths of water erosion resistant crop species with non-water erosion resistant crop species. Widths will be determined using current water erosion prediction technology to meet objectives. The design and implementation of a stripcropping system will minimize wind, sheet and rill erosion, protect soil quality, reduce offsite sedimentation, and benefit offsite aquatic wildlife habitat. Erosion prediction before and after practice application will be recorded showing the design and benefits of the practice. Erosion resistant strips in rotation must be managed to maintain the planned vegetative cover and surface roughness.

**Feature Measure:** area of strips

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $170.76

**Scenario Cost/Unit:** $2.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |

**Practice:** 587 - Structure for Water Control

**Scenario** #1 - Inlet Flashboard Riser, Metal Regional

**Scenario Description:**

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 36" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment. Associated Practices: Critical Area Seeding (342), Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Before Situation:**

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

**After Situation:**

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342).

**Feature Measure:** Flashboard Weir Length (in) x barre

**Scenario Unit:** Inch-Foot

**Scenario Typical Size:** 1,800.00

**Scenario Total Cost:** $11,181.56

**Scenario Cost/Unit:** $6.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 190 | $799.90 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 10 | $64.10 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 2 | $179.44 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 5 | $255.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Pipe, Steel, 30 in., Std Wt, USED | 1361 | Materials: - USED - 30 inch - Steel Std Wt | Feet | $151.63 | 50 | $7,581.50 |
| Pipe, Steel, 36 in., Std Wt, USED | 1362 | Materials: - USED - 36 inch - Steel Std Wt | Feet | $167.11 | 6 | $1,002.66 |
| Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in. | 1372 | Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36 | Feet | $5.44 | 24 | $130.56 |
| Steel, Plate, 3/8 in. | 1375 | Flat steel plate, 3/8 inch thickness. Materials only. | Square Feet | $21.57 | 4 | $86.28 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 32 | $146.56 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #2 - Inline Flashboard Riser, Metal Regional

**Scenario Description:**

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at the embankment. They are often fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a "Half-Round" flashboard riser shop fabricated using a longitudinal cut 36" smooth steel pipe, a 50' long - 30" outlet pipe passing through an embankment. Associated Practices: Critical Area Planting, Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Before Situation:**

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

**After Situation:**

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342).

**Feature Measure:** Flashboard Weir Length (in) x Barre

**Scenario Unit:** Inch-Foot

**Scenario Typical Size:** 1,800.00

**Scenario Total Cost:** $11,725.05

**Scenario Cost/Unit:** $6.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 190 | $799.90 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 15 | $96.15 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 4 | $358.88 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 7 | $358.12 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Materials** | | | | | | |
| Pipe, Steel, 30 in., Std Wt, USED | 1361 | Materials: - USED - 30 inch - Steel Std Wt | Feet | $151.63 | 50 | $7,581.50 |
| Pipe, Steel, 36 in., Std Wt, USED | 1362 | Materials: - USED - 36 inch - Steel Std Wt | Feet | $167.11 | 6 | $1,002.66 |
| Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in. | 1372 | Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36 | Feet | $5.44 | 24 | $130.56 |
| Steel, Plate, 3/8 in. | 1375 | Flat steel plate, 3/8 inch thickness. Materials only. | Square Feet | $21.57 | 10 | $215.70 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.58 | 4 | $18.32 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #3 - Commercial Inline Flashboard Riser Regional

**Scenario Description:**

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or "stoplogs". This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24" or less. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20", height of six feet, The pipe is 50' of 15" SCH 40 PVC (inlet and outlet combined). Associated Practices: Critical Area Planting (342), Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

**Before Situation:**

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

**After Situation:**

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342).

**Feature Measure:** Flashboard Weir Length (in) x Barre

**Scenario Unit:** Inch-Foot

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $6,272.38

**Scenario Cost/Unit:** $6.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 190 | $799.90 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 15 | $96.15 |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 2 | $179.44 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Pipe, PVC, 16 in., SCH 80 | 1353 | Materials: - 16 inch - PVC - SCH 80 - ASTM D1785 | Feet | $76.99 | 50 | $3,849.50 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only. | Each | $342.72 | 1 | $342.72 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $17.29 | 10 | $172.90 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 587 - Structure for Water Control

**Scenario** #4 - Culvert <30 inches HDPE

**Scenario Description:**

Install a new HDPE culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing for culverts ≥ 30 inches or perennial flow. Associated practices: Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

**Before Situation:**

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

**After Situation:**

Water is conveyed in a controlled manner.

**Feature Measure:** Pipe Diameter (In) x Pipe Length (Ft

**Scenario Unit:** Inch-Foot

**Scenario Typical Size:** 960.00

**Scenario Total Cost:** $3,357.02

**Scenario Cost/Unit:** $3.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 5 | $12.80 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 45 | $288.45 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 2 | $293.54 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 5 | $155.75 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in. | 1246 | Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $31.96 | 40 | $1,278.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 587 - Structure for Water Control

**Scenario** #5 - Culvert <30 inches CMP

**Scenario Description:**

Install a new Corrugated Metal Pipe (CMP) culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing instead for culverts ≥ 30 inches or perennial flow. Associated practices: Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

**Before Situation:**

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

**After Situation:**

Water is conveyed in a controlled manner.

**Feature Measure:** Pipe Diameter (In) x Pipe Length (Ft

**Scenario Unit:** Inch-Foot

**Scenario Typical Size:** 960.00

**Scenario Total Cost:** $3,525.42

**Scenario Cost/Unit:** $3.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 5 | $12.80 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 45 | $288.45 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 2 | $293.54 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 5 | $155.75 |
| Pipe, CMP, 24 in., 12 Gauge | 1417 | 24 inch Corrugated Metal Pipe, Galvanized, Uncoated, 12 gauge. Material cost only. | Feet | $36.17 | 40 | $1,446.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 587 - Structure for Water Control

**Scenario** #6 - Trench Drain with grate

**Scenario Description:**

This involves installing a concrete cross drain with grate to collect and redirect surface away from another practice to reduce volume of nutrient materials to be collected. Typically used up gradient of a heavy use area and/or waste storage faciliity. Associated practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area (561), Roof Runoff Structure (558), Underground Outlet (620) Waste Storage Facility (313), Waste Trasnfer (634), Solid/Liquid Waste Separation Facility (632)

**Before Situation:**

Upsite surface water adding additional volume to existing heavy use area or waste storage facility.

**After Situation:**

Install a12' long 1" wide by 18" deep concrete box to direct runoff away from existing HUA.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,967.78

**Scenario Cost/Unit:** $1,967.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1.2 | $648.36 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 0.5 | $15.58 |
| Welded Bar Grate, metal | 1980 | Heavy duty vertical bar welded grating, typically 1-1/4 x 3/16 in. bars on 1 in. spacing with cross rod on 4 in. spacing. Materials only. | Square Feet | $18.74 | 15 | $281.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #7 - Water Bar

**Scenario Description:**

This scenario is the installation of a permanant water bar to direct water off an existing animal trail or access road. Installation of water bars on new animal trails or access roads is covered by that practice. This scenario assists in addressing the resource concerns: water management. Associated Practices: Animal Trails Walkways (575 ), Access road(560), Diversion (362), Grass Waterway (412)

**Before Situation:**

Surface water flowing down associated practice causeing scouring or installation avoids same situation.

**After Situation:**

Three water bars are installed at intervals as per standard. Construction involved reshaping existing site, rolling sub-base,and placing compacted gravel surface at an angle accross the associated practice. Other options include buried industrial belting on edge or two timber buried with spacer for water flow. Typical situation is a spacing of 300 per feet over 1000 feet of roadway.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $2,368.76

**Scenario Cost/Unit:** $789.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1 | $4.21 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 3 | $283.53 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 3 | $149.43 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 28 | $872.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 587 - Structure for Water Control

**Scenario** #8 - Grated Dropbox

**Scenario Description:**

This involves installing a concrete box with grate to collect and redirect surface water away from another practice to reduce volume of nutrient materials to be collected or to prevent surface erosion. Typically used up gradient of a heavy use area and/or waste storage faciliity. Associated practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area (561), Roof Runoff Structure (558), Underground Outlet (620) Waste Storage Facility (313), Waste Trasnfer (634), Solid/Liquid Waste Separation Facility (632)

**Before Situation:**

Upsite surface water causing downslope erosion or adding cleanwater to nutrient rich areas.

**After Situation:**

Install 2'x4'x4' deep concrete box with grate to collect surface water.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,885.24

**Scenario Cost/Unit:** $1,885.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 1 | $53.21 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 0.4 | $12.46 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #9 - Slide Gate Regional

**Scenario Description:**

This scenario is the installation of a permanent slide gate structure to control the conveyance of water. The typical size is a 4' diameter opening. The slide gate may be installed on an open channel or pipeline. The slide gate is made of steel and has a hand operated mechanical lifting system, i.e. screw. This scenario assists in addressing the resource concerns: water management. Associated Practices: 533-Pumping Plant.

**Before Situation:**

A channel or pipeline is in need of a head gate to control the flow of water.

**After Situation:**

A 4' slide gate is installed and operated by hand is installed.

**Feature Measure:** diameter

**Scenario Unit:** Feet

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $9,728.43

**Scenario Cost/Unit:** $2,432.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 6 | $319.26 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| **Materials** | | | | | | |
| Screw gate, cast iron, 4 ft. diameter, 10/0 head | 1746 | 4 ft. diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Includes materials only. | Each | $7,606.81 | 1 | $7,606.81 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #10 - Flap Gate Regional

**Scenario Description:**

This scenario is the installation of a permanent flap (tide) gate structure to control the direction of flow resulting from tides or high water or back-flow from flooding. The typical size is a 4' diameter opening. The gate may be installed on an open channel or pipeline. It is made of steel and operates automatically. This scenario assists in addressing the resource concerns: water management. Associated practices: Shallow water development and management (646), Wetland Wilfdlife Habitat Management (644)

**Before Situation:**

A wetland or other area is in need of a flap gate to control the direction of the water.

**After Situation:**

A flap gate 4' wide is installed.

**Feature Measure:** Feet Diameter (of Gate)

**Scenario Unit:** Feet

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $9,552.14

**Scenario Cost/Unit:** $2,388.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 6 | $319.26 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| **Materials** | | | | | | |
| Flap Gate, cast iron, 4 ft. diameter | 1745 | 4 ft. diameter cast iron flap gate. Materials only. | Each | $7,430.52 | 1 | $7,430.52 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #11 - Flap Gate w/ Concrete Wall Regional

**Scenario Description:**

Install a concrete cut off wall with tide gate at the outlet of a channel. A typical scenario would be installed in a 25 foot channel, 6 foot deep, with 2:1 side slopes. A concrete wall will extend 10 feet on each side, and include a 4' flap gate structure to control flooding. Work includes site preparation, forming and pouring concrete, backfilling and acquiring and installing the tide gate.

**Before Situation:**

Tides or flooding inundate and affect water quality of wetlands or other managed systems.

**After Situation:**

Tide or flood inundation is controlled. Associated practices could be Aquaculture Ponds (397), Aquatic Organism Passage (396), Bivalve Aquaculture Gear and Biofouling Control (400), Constructed Wetland (656), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Field Ditch (388), Irrigation System, Surface and Subsurface (443), Irrigation Water Management (449), Salinity and Sodic Soil Management (610), Subsurface Drain (606), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), Wetland Creation (658), Wetland Enhancement (659), Wetland Restoration (657), and Wetland Wildlife Habitat Management (644).

**Feature Measure:** Cubic Yards of Concrete

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $15,347.06

**Scenario Cost/Unit:** $1,534.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 10 | $5,403.00 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 200 | $512.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 200 | $842.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 4 | $121.44 |
| Flap Gate, cast iron, 4 ft. diameter | 1745 | 4 ft. diameter cast iron flap gate. Materials only. | Each | $7,430.52 | 1 | $7,430.52 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 4 | $1,005.88 |

**Practice:** 587 - Structure for Water Control

**Scenario** #12 - Rock Checks for Water Surface Profile Regional

**Scenario Description:**

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a "Vee" shaped rock structures with points facing upstream for the purpose of raising the water surface profile. Cost estimate is for three check dams with a top width of 3', max height of 6', min height of 3', and 28' length; containing an average of 58 cubic yards or 29 tons of rock for a total of 87 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion. Associated Practices: Critical Area Planting (342), Streambank and Shoreline Protection (580), Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

**Before Situation:**

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the stream.

**After Situation:**

Banks are stabilized, and pools are created raising the Water Surface Profile elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342).

**Feature Measure:** Tons of rock installed

**Scenario Unit:** Ton

**Scenario Typical Size:** 87.00

**Scenario Total Cost:** $9,720.83

**Scenario Cost/Unit:** $111.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 84 | $136.92 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 57 | $8,365.89 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 587 - Structure for Water Control

**Scenario** #13 - In-Stream Structure for Water Surface Profile Regional

**Scenario Description:**

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a "Vee" shaped concrete structure which points facing upstream for the purpose of raising the water surface profile. Cost estimate is for one cross vane with a effective length (Streambed width) of 36', and total length of 65', effective height of 3', max height of 6', and a 3' by 1.5' footer; containing 19 cubic yards of Concrete. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion. Associated Practices: Critical Area Planting (342), Streambank and Shoreline Protection (580) Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

**Before Situation:**

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the stream.

**After Situation:**

Banks are stabilized, and pools are created raising the water surface elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342).

**Feature Measure:** Streambed Width

**Scenario Unit:** Feet

**Scenario Typical Size:** 36.00

**Scenario Total Cost:** $12,534.71

**Scenario Cost/Unit:** $348.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 19 | $10,265.70 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 18 | $46.08 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 1 | $427.02 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 7 | $374.57 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 587 - Structure for Water Control

**Scenario** #14 - CMP Turnout Regional

**Scenario Description:**

A corrugated metal pipe (CMP) equipped with a slide gate diverts water from a ditch or canal into a field or field ditch. This scenario is for a 15 inch diameter gate and pipe that will transmit approximately 4 cfs of flow. Associated Practices: Irrigation Water Management (449)

**Before Situation:**

A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

**After Situation:**

Water is diverted from a canal or ditch to meet irrigation requirements. A 15 inch diameter CMP is installed through the canal containment dike,. A 15 inch diameter slide gate is attached to the upstream end of the pipe. The top of the pipe inlet is below canal water surface elevation.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,208.02

**Scenario Cost/Unit:** $1,208.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Pipe, CMP, 12 in., 16 Gauge | 1269 | 12 inch Corrugated Metal Pipe, Galvanized, Uncoated, 16 gauge. Material cost only. | Feet | $21.23 | 10 | $212.30 |
| Slide gate, steel, 1 ft. diameter, low head | 1830 | 1 ft. diameter steel slide gate for low head installations | Each | $189.44 | 1 | $189.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #15 - Concrete Turnout Structure - Small Regional

**Scenario Description:**

A reinforced concrete turnout structure equipped with slide boards or panels diverts irrigation water from a ditch or canal into a field or field ditch. This scenario is for a four ft tall, two foot wide, and five foot long turnout structure. Associated Practices: Irrigation Water Management (449)

**Before Situation:**

A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

**After Situation:**

Water is diverted from a canal or ditch to meet irrigation requirements. A two foot wide and four foot tall turnout structure equipped with slots for slide boards and panels conducts water through the canal berm into a field. The concrete structure is five feet long and has an end sill. All footings, floors. and walls have a minimum thickness of six inches. The structure delivers water to field elevation or ditch bottom elevation. The top of the pipe inlet is below canal water surface elevation.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,670.77

**Scenario Cost/Unit:** $1,670.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2 | $1,080.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 1 | $53.21 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #16 - Concrete Turnout Structure Regional

**Scenario Description:**

A reinforced concrete turnout structure equipped with a 48 inch slide gate diverts irrigation water from a canal into a field or field ditch. This scenario is for a six ft tall, eight foot wide, and ten foot long turnout structure. A sloping trash rack fabricated from rebar is installed on the inlet. If needed fish screens may be installed at the inlet. Associated Practices: Irrigation Water Management (449)

**Before Situation:**

A delivery canal exists, but a means to move water from the canal into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

**After Situation:**

Water is diverted from a canal to meet irrigation requirements. A eight foot wide and six foot tall turnout structure equipped with a 48 inch slide gate conducts water through the canal berm. The concrete structure is ten feet long and has an end sill. All footings, floors. and walls have a minimum thickness of six inches. The structure delivers water to field or ditch bottom elevation.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,775.08

**Scenario Cost/Unit:** $4,775.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 5 | $2,701.50 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| **Materials** | | | | | | |
| Welded Bar Grate, metal | 1980 | Heavy duty vertical bar welded grating, typically 1-1/4 x 3/16 in. bars on 1 in. spacing with cross rod on 4 in. spacing. Materials only. | Square Feet | $18.74 | 48 | $899.52 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #17 - Flow Meter with Mechanical Index

**Scenario Description:**

Permanently installed water flow meter with mechanical, cumulative volume and rate index. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

**Before Situation:**

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

**After Situation:**

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

**Feature Measure:** Nominal Diameter of Meter

**Scenario Unit:** Inch

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,783.35

**Scenario Cost/Unit:** $178.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Flow Meter, with mechanical Index | 1450 | 10 inch, Turbine Type Flow Meter with Mechanical Index, permanently installed. Includes materials and shipping only. | Each | $1,644.47 | 1 | $1,644.47 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 587 - Structure for Water Control

**Scenario** #18 - Flow Meter with Electronic Index

**Scenario Description:**

Permanently installed water flow meter with an electronic index . Meters can be any flow measurement device that meets CPS 433, (i.e., meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes or data logging capability. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch turbine flow meter, with electronic index output. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waster Transfer, and 590-Nutrient Management.

**Before Situation:**

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

**After Situation:**

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

**Feature Measure:** Nominal Diameter of Meter

**Scenario Unit:** Inch

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $3,623.00

**Scenario Cost/Unit:** $362.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,484.12 | 1 | $3,484.12 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 587 - Structure for Water Control

**Scenario** #19 - Flow Meter with Electronic Index & Telemetry

**Scenario Description:**

Permanently installed water flow meter with an electronic flow rate and volume index and data telemetry transmission system. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch magnetic flow meter, with electronic index output and telemetry data transfer system for monitoring irrigation system flow rate. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

**Before Situation:**

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

**After Situation:**

Producer is able to access instantaneous rate and cumulative flow volume data from a personal computer or cell phone at any time. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

**Feature Measure:** Nominal Diameter of Meter

**Scenario Unit:** Inch

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,919.19

**Scenario Cost/Unit:** $491.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Flow Meter, with electronic Index and telemetry | 1451 | 10 inch Magnetic Irrigation Flow Meter, with electronic index and equipped for telemetry, permanently installed. Includes material and shipping only. | Each | $4,780.31 | 1 | $4,780.31 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 587 - Structure for Water Control

**Scenario** #20 - Gated Pipe

**Scenario Description:**

This involves spreading water to prevent surface erosion. Typically stormwater or water that may have extremely low levels of nutrients or small solids. Distribution above an existing grassed area. If the water has definable nutrients, use the Vegetated Treatment Area standard. Associated practices: Animal Mortality Facility (316), Composting Facility (317), Heavy Use Area (561), Roof Runoff Structure (558), Underground Outlet (620) Waste Storage Facility (313), Waste Trasnfer (634), Solid/Liquid Waste Separation Facility (632)

**Before Situation:**

Surface water flowing down associated practice causeing scouring or installation avoids same situation.

**After Situation:**

Install 200 LF of 6" gated/perforated pipe to distribute water in an existing grassed area.

**Feature Measure:** Length of pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $3,972.79

**Scenario Cost/Unit:** $19.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Post, Wood, CCA treated, 4 in x 8 ft | 10 | Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only. | Each | $14.07 | 13 | $182.91 |
| Block, concrete | 253 | Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only | Each | $2.32 | 25 | $58.00 |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $7.06 | 200 | $1,412.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 587 - Structure for Water Control

**Scenario** #21 - Sprinkler gun

**Scenario Description:**

This involves spreading water to prevent surface erosion. Typically stormwater or water that may have extremely low levels of nutrients or small solids. Distribution is on a site that is not typically down hill from source or is not contoured for other methods of distribution on an existing grassed area. Method used are one or more large sprinkler guns. Cost per gun includes piping between guns. If the water has definable nutrients, use the Vegetated Treatment Area standard. Associated practices: Heavy Use Area (561), Roof Runoff Structure (558), Underground Outlet (620), Solid/Liquid Waste Separation Facility (632)

**Before Situation:**

Surface water flowing down associated practice causeing scouring or installation avoids same situation.

**After Situation:**

Three sprinkler pods are installed and piped together to spray water over an existing grassed area.

**Feature Measure:** Number of guns

**Scenario Unit:** Each

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $2,759.22

**Scenario Cost/Unit:** $919.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 160 | $244.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Irrigation, Pod System, w/Appurtenances | 323 | Pod irrigation system that includes pod, pipe, sprinklers, connections, and appurtenances. Includes materials only. | Each | $306.03 | 3 | $918.09 |
| Pipe, PVC, 4 in., SDR 21 | 986 | Materials: - 4 inch - PVC - SDR 21 200 psi - ASTM D2241 | Feet | $5.54 | 160 | $886.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #283 - Forestland Waterbar

**Scenario Description:**

This scenario is utilized for the installation of permanant water bars to direct water off an existing forest trail or access road to correct an existing soil erosion problem. Installation of water bars on new forest trails (655) is not covered by this practice scenario. This scenario is installed into existing soils, using a small to medium sized dozer with an angle blade. All disturbed soils are seeded down with an acceptable shade tolerant grass (or Grass/Legume) seed mix using NRCS CPS 342, Critical Area Planting.

**Before Situation:**

Sloping forest trail carries excessive runoff during rainfall events resulting in erosion of the trail and transport of soil and sediment to nearby water bodies.

**After Situation:**

Properly seeded waterbars direct runoff away from trail.

**Feature Measure:** Waterbar

**Scenario Unit:** Each

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $825.23

**Scenario Cost/Unit:** $165.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 2.5 | $183.73 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2.5 | $85.05 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 587 - Structure for Water Control

**Scenario** #284 - Basin, earthen

**Scenario Description:**

An earth embankment constructed across the upper end of a water course to redirect flow into an inlet or riser connected to a existing or new underground outlet.. Typical top width 4' with an inside slope of 2:1 and an outside slope of 5:1 or flatter. Typical depth from 2 to 6' with the length of fill from 20 to 60'.The purpose is to facilitate flow redirection and allow some collection of trash and sediment. Associated Practices: Critical Area Planting (342), Underground Outlet (620) lined waterway or outlet (468) Mulching (484)

**Before Situation:**

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping trash and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

**After Situation:**

A 35 foot long embankment is constructed with CY of excavation/earthfill to build an earthen basin. Rill and/or gully erosion is reduced. Water is redirected into underground piping system. Part of system to protect grassed waterway.

**Feature Measure:** Length of embankment

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 35.00

**Scenario Total Cost:** $1,112.62

**Scenario Cost/Unit:** $31.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 4 | $403.76 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 587 - Structure for Water Control

**Scenario** #318 - nline WCS, Subsurface Drainage Control, float activated head pressure valve

**Scenario Description:**

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through an inline water level control structure which is used in conjunction with 3 float activated head pressure valves. Each float activated head pressure valve increases the zone of influence by 1'. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time allows nutrients to be reduced by bacteria such that the nutrients do not leave with the water. Multiple buried float-activated structures can be used to extend the influence of a single inline water control structure. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

**Before Situation:**

The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

**After Situation:**

The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile removes nutrients. Typical affected area for a single structure is 10-20 acres.

**Feature Measure:** Number of Structures

**Scenario Unit:** Each

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $3,862.05

**Scenario Cost/Unit:** $1,287.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 9 | $478.89 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 9 | $481.59 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $7.06 | 120 | $847.20 |
| Water Level Control Valve, Inline | 2189 | Automatic float valve for drainage pipes up to 8 inch dia. To maintain head differential in flowing agricultural drains. | Each | $563.97 | 3 | $1,691.91 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 587 - Structure for Water Control

**Scenario** #344 - Automated DWM Control Structure, 12 to 18 inch diameter pipe

**Scenario Description:**

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which is operated with an automated slide gate and accommodates 12 to 18 inch diameter pipe sizes. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single automated structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

**Before Situation:**

Uncontrolled discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

**After Situation:**

The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of automated control structures allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with an automated slide gate may have its influence extended by use of buried float-activated control structures.

**Feature Measure:** Number of Structures

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $10,448.25

**Scenario Cost/Unit:** $10,448.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $528.75 | 1 | $528.75 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,660.98 | 1 | $1,660.98 |
| Pipe, PVC, 15 in., SDR 35 | 1722 | Materials: 15 inch - PVC - SDR35 - ASTM D3034 | Feet | $42.44 | 40 | $1,697.60 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only. | Each | $342.72 | 1 | $342.72 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $17.29 | 113 | $1,953.77 |
| Valve, Inline, => 12 inch dia. | 2368 | Inline valve greater than or equal to 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only. | Each | $3,356.69 | 1 | $3,356.69 |
| Light Duty Linear Actuator | 2724 | 12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating. | Each | $156.87 | 1 | $156.87 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 587 - Structure for Water Control

**Scenario** #360 - Automation Retrofit to Manual Drainage Water Management Control Structure

**Scenario Description:**

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which has been retrofitted to operate with an automated slide gate. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single retrofitted automated retrofit structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Field Sediment, Nutrient and Pathogen Loss. Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management.

**Before Situation:**

Control structure with manually operated slide gate.

**After Situation:**

The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of retrofitted control structures for automated slide gate operation allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with a retrofitted automated slide gate may have its influence extended by use of buried float-activated control structures.

**Feature Measure:** Number of Structures

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,035.23

**Scenario Cost/Unit:** $7,035.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.25 | $198.67 |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $528.75 | 1 | $528.75 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,660.98 | 1 | $1,660.98 |
| Battery Bank, Hydroelectric | 2593 | Device used to provide a way to store surplus energy when more is being produced than consumed. When demand increases beyond what is generated, the batteries can be called on to release energy to keep household loads operating. Includes materials and shipping only. | Each | $714.04 | 1 | $714.04 |
| Light Duty Linear Actuator | 2724 | 12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating. | Each | $156.87 | 1 | $156.87 |

**Practice:** 587 - Structure for Water Control

**Scenario** #422 - Automated DWM Control Structure, 6 to 10 inch diameter pipe

**Scenario Description:**

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which is operated with an automated slide gate and accommodates 6 to 10 inch diameter pipe sizes. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single automated structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

**Before Situation:**

Uncontrolled discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

**After Situation:**

The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of automated control structures allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with an automated slide gate may have its influence extended by use of buried float-activated control structures.

**Feature Measure:** Number of Structures

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $5,717.90

**Scenario Cost/Unit:** $5,717.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 21 | 988 | Materials: - 8 inch - PVC - SDR 21 200 psi - ASTM D2241 | Feet | $20.31 | 40 | $812.40 |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $528.75 | 1 | $528.75 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,660.98 | 1 | $1,660.98 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only. | Each | $342.72 | 1 | $342.72 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $17.29 | 60 | $1,037.40 |
| Valve, Inline, < 12 inch dia. | 2367 | Inline valve less than 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only. | Each | $427.91 | 1 | $427.91 |
| Light Duty Linear Actuator | 2724 | 12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating. | Each | $156.87 | 1 | $156.87 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 588 - Crosswind Ridges

**Scenario** #9 - Two Crops Per Year

**Scenario Description:**

Cropland with soils that are stable enough to sustain effective ridges and cloddiness to prevent or reduce wind erosion, emissions of particulate matter, or improve plant productivity and health by reducing risk of wind damage. Climate supports two crops per year. This practice does not apply on sandy soils and certain organic soils. Associated practices are Conservation Crop Rotation 328, Cover Crop 340, and Residue and Tillage Management 345.

**Before Situation:**

Current tillage, cultivation , or planting operations are not aligned correctly to the prevailing wind direction during critical wind erosion periods. High wind events create wind erosion loss at or above T, or above the crop tolerance to damage by windblown soil particles. Particulate emissions create safety hazards on adjacent roads.

**After Situation:**

Crosswind Ridges have been designed and installed aligning correctly with the prevailing wind direction during critical wind erosion periods. Wind erosion is reduce, particulate matter emissions are reduced. Plant productivity is improved within crop tolerance levels.

**Feature Measure:** Acres of Crosswind Ridges Installed

**Scenario Unit:** Acres

**Scenario Typical Size:** 70.00

**Scenario Total Cost:** $4,155.95

**Scenario Cost/Unit:** $59.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 140 | $2,818.20 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 25 | $1,337.75 |

**Practice:** 588 - Crosswind Ridges

**Scenario** #10 - Crosswind Ridges

**Scenario Description:**

Cropland with soils that are stable enough to sustain effective ridges and cloddiness to prevent or reduce wind erosion, emissions of particulate matter, or improve plant productivity and health by reducing risk of wind damage. This practice does not apply on sandy soils and certain organic soils. Crop rotation allows only one crop per year.

**Before Situation:**

Current tillage, cultivation , or planting operations are not aligned correctly to the prevailing wind direction during critical wind erosion periods. High wind events create wind erosion loss at or above T, or above the crop tolerance to damage by windblown soil particles. Particulate emissions create safety hazards on adjacent roads.

**After Situation:**

Crosswind Ridges have been designed and installed aligning correctly with the prevailing wind direction during critical wind erosion periods. Wind erosion is reduce, particulate matter emissions are reduced. Plant productivity is improved within crop tolerance levels.

**Feature Measure:** Acres of Crosswind Ridges Installed

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $4,558.55

**Scenario Cost/Unit:** $28.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 160 | $3,220.80 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 25 | $1,337.75 |

**Practice:** 589 - Cross Wind Trap Strips

**Scenario** #4 - Annual Strips

**Scenario Description:**

The implementation of cross wind trap strips with annual grasses, forbs, or legumes established in one or more strips typically perpendicular to the most erosive wind events for one or more of the following purposes: 1) to reduce soil erosion by wind, 2) reduce wind-borne sediment deposition, 3) induce snow deposition to improve soil moisture, 4) protect sensitive crops from wind-borne soil particulate damage, and 5) improve air quality by reducing airborne particulate matter. In this resource setting, cropland fields are unprotected against the erosive forces of wind that cause soil loss, damage to crop seedlings, sediment deposition and/or poor air quality. The scenario is based on the acres of strips established.

**Before Situation:**

Cropland fields 80 acres in size and larger, have excessive soil disturbance and unsheltered distances that result in excessive wind erosion that damage soil quality as well as reduce air quality. Depending on the time of year, soil condition, and stage of crop growth, wind velocities may cause sandblasting or covering up of newly planted seedlings, increase off-site damage due to soil deposition, or reduce air quality by the generation of airborne particulate matter. The cropping system coupled with intensive tillage provide an environment where wind erosion occurs at rates over tolerable soil and/or sensitive crop limits.

**After Situation:**

Implementation Requirements will be prepared for the site according to the Cross Wind Trap Strips (589) standard. Appropriate orientation and width of trap strips will be determined using current WEPS (wind erosion prediction system) technology. The planned trap strip system will meet appropriate criteria for the resource concern (i.e. stand erect during the design critical period, be placed upwind for snow accumulation or protection of sensitive crops, meet the minimum height criteria, etc.). Implementation will reduce soil loss to a tolerable level.

**Feature Measure:** acre of trap strips

**Scenario Unit:** Acres

**Scenario Typical Size:** 8.00

**Scenario Total Cost:** $2,604.55

**Scenario Cost/Unit:** $325.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 8 | $105.68 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 8 | $48.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 4 | $89.08 |
| Seeding Operation, No Till/Strip Till Planter | 1230 | No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor. | Acres | $27.52 | 4 | $110.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 25 | $1,337.75 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 8 | $133.44 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 8 | $457.92 |

**Practice:** 590 - Nutrient Management

**Scenario** #1 - Basic NM (Non-Organic/Organic)

**Scenario Description:**

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where there is no manure application. Scenario is applicable on non-organic and organic land. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required.

**Before Situation:**

In this geographic area, a fertility program is either nonexistent or does not meet the Nutrient Management (590) CPS. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

**After Situation:**

A nutrient management system will be developed to meet the current Nutrient Management (590) CPS, when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing is completed according to LGU recommendations. Records will be provided annually of the current soil test, analysis, application rates, forms and rates of nutrients for each field, including crop yields. Nutrient applications will be completed according to the Nutrient Management Plan that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $449.14

**Scenario Cost/Unit:** $11.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |

**Practice:** 590 - Nutrient Management

**Scenario** #2 - Basic NM with Manure Injection or Incorporation

**Scenario Description:**

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where all applied nutrient sources (nitrogen, phosphorus, and potassium) are either incorporated using tillage at least 3-4 inches deep or injected into the soil at least 3-6 inches deep (Exceptions for incorporation or injection include: established close grown crops such as wheat or perennial crops such as hay or pasture). This scenario is applicable on non-organic and organic land for all nutrient sources (manure, compost, commercial fertilizers, and organic sources of nutrients). Micro-nutrients may be surface applied. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement (incorporation or injection), and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure analysis, incorporation or injection of all nutrients, and the implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to address the Nutrient Management (590) purposes for nitrogen losses via N2O emissions, nitrogen leaching, and nitrogen and phosphorus surface runoff. The basis for nutrient applications will be recommendations based on soil tests; and when applicable, plant tissue, manure, and compost analyses. Soil loss is controlled to the soil loss tolerance criteria or less for the significant soil map unit.

**Before Situation:**

In this geographic area, a fertility program is not properly managed to supply the proper rate, timing, method of application, and source to address air and water quality. Application of fertilizers, including manures, composts, and amendments, are surface applied and completed annually based upon tradition that does not specifically consider the detrimental effects of improper timing or rates of all nutrient sources, or excess nutrient buildup in the soil, emissions of N2O, surface runoff, or the leaching of nitrogen to ground or surface water via subsurface drainage. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Soil testing is not completed on a regular basis and applications of all nutrient sources are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade air and water quality. Soil quality may be degraded by excess or inadequate nutrients and erosion. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion in excess of the planning criteria.

**After Situation:**

A nutrient management system is developed with the producer to meet the current Nutrient Management (590) CPS; and when applicable, the system will also meet NOP regulations. All nutrient sources will be incorporated with tillage at least 3-4 inches deep or injected at least 4-6 inches deep into the soil (Exceptions for incorporation or injection include: established close grown crops such as wheat or perennial crops such as hay or pasture). Implementation of the nutrient management plan (NMP) will benefit plant productivity while also reducing the potential for off-site degradation. A nutrient management budget will be developed for each field based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing (and where applicable manure analyses, plant tissue analyses, etc.) is completed according to LGU recommendations. Applications of all phosphorus and nitrogen sources are based on risk assessments (PI - phosphorus index and leaching index). Records will be provided annually documenting current soil tests and other plant or manure analyses, date and rate of applications, form and placement of nutrients for each field, including post-harvest yields. Nutrient applications will be completed according to the NMP that minimizes nutrient runoff, nitrogen leaching, nitrogen emissions, or buildup of excess nutrient concentrations in the soil.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $1,751.74

**Scenario Cost/Unit:** $43.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 40 | $805.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 1 | $46.24 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 1 | $57.72 |

**Practice:** 590 - Nutrient Management

**Scenario** #3 - Basic NM (Organic/NonOrganic) greater than or equal to 0.5-10 acres

**Scenario Description:**

Scenario is applicable on non-organic and organic land. Scenario implementation of a basic nutrient management system on small, often diversified farm systems typically between 0.5-10 acres where manure and/or compost may be utilized either alone or in conjunction with commercial fertilizer. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure and/or compost analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to encourage producers to effectively utilize commercial fertilizers, organic fertilizers, manure, and/or compost appropriately improving soil quality and minimizing runoff of nutrients from fields to surface waters. The basis for nutrient applications will be recommendations based on soil, manure, and compost analyses.

**Before Situation:**

In this geographic area, a fertility program is either nonexistent or does not meet the Nutrient Management (590). Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

**After Situation:**

A nutrient management system will be developed to meet the current Nutrient Management (590), when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field, crop block, or crop rotation within a block/field based on soil test analysis and land grant university recommendations or crop removal rates. Application of nutrients will be completed at the proper rate, timing, and methods, and sources per the NMP. Records will be provided annually of current soil test, analysis, application timing, nutrient source, application method, application rate, and crop yields for each block. Nutrient applications will be completed according to the NMP that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

**Feature Measure:** <Unknown>

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $363.90

**Scenario Cost/Unit:** $363.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 1 | $46.24 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 1 | $57.72 |

**Practice:** 590 - Nutrient Management

**Scenario** #4 - Basic NM with Manure and/or Compost (Non-Organic/Organic)

**Scenario Description:**

This scenario describes the implementation of a basic nutrient management system on > = 40 acres of cropland or hayland where manure and/or compost is utilized either alone or in conjunction with commercial fertilizer. Scenario is applicable on non-organic and organic land. The planned NM system will meet the current Nutrient Management (590) CPS. Implementation will result in the proper rate, source, method of placement, and timing of nutrient application. Payment for implementation is to defray the costs of soil testing, manure and/or compost analysis, and implementation of the nutrient management plan and recordkeeping. Records demonstrating implementation of the 4 R's of NM will be required. Scenario is designed to encourage producers to effectively utilize commercial fertilizers, organic fertilizers, manure, and/or compost appropriately improving soil quality and minimizing runoff of nutrients from fields to surface waters. The basis for nutrient applications will be recommendations based on soil, manure, and compost analyses.

**Before Situation:**

In this geographic area, a fertility program is either nonexistent or at a basic level. Application of fertilizers, including manures, composts, and amendments, are completed annually based upon tradition that does not specifically consider the detrimental effects of improper timing or rates of nutrients, or excess nutrient buildup in the soil. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff, drainage tile, or soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients. Fields have little or no erosion protection during critical periods often times resulting in sheet, rill, and ephemeral erosion.

**After Situation:**

A nutrient management system will be developed to meet the current Nutrient Management (590) CPS, when applicable system will also meet NOP regulations. Development and implementation of a nutrient management plan (NMP) will benefit plant productivity while also reducing potential for off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units typically 40 acres or larger, soil testing is completed according to LGU recommendations. Records will be provided annually of the current soil test, analysis, application rate, forms and rates of nutrients for each field, including crop yields. Nutrient applications will be completed according to the Nutrient Management Plan that minimizes nutrient runoff and leaching or buildup of excess nutrient concentrations.

**Feature Measure:** <Unknown>

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $946.54

**Scenario Cost/Unit:** $23.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 1 | $46.24 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 1 | $57.72 |

**Practice:** 590 - Nutrient Management

**Scenario** #8 - Adaptive NM

**Scenario Description:**

The practice scenario is for the implementation of nutrient management on a small plot, as detailed in outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement various nutrient use efficiency improvement methods for timing, rate, method of application, or source of nutrients.

**Before Situation:**

The practice will be installed on cropland (small grain rotation or typical corn-soybean rotation) to address water quality degradation, air quality degradation and energy concerns. The scenario applies to non-organic and organic operations.

**After Situation:**

Installation of this scenario will result in adopting the four R's of nutrient management following the procedures outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Implementation involves establishing the replicated plots to evaluate one or more of the 4 R's. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant or extension professional knowledgeable in nutrient management and experimental design and data collection. Results are used to make nutrient application decisions to address water quality degradation issues and nutrient use efficiencies. Yields will be measured and statistically analyzed and summarized following the procedures in Agronomy Technical Note 7. The yields for each plot will be adjusted to the appropriate moisture content.

**Feature Measure:** <Unknown>

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,310.59

**Scenario Cost/Unit:** $3,310.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Aerial Imagery | 966 | Aerial imagery. RBG (color), infrared or NDVI single image. | Acres | $1.85 | 1 | $1.85 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 25 | $805.50 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 15 | $1,984.20 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 14 | $343.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 14 | $145.04 |

**Practice:** 590 - Nutrient Management

**Scenario** #296 - Small Scale Basic Nutrient Management

**Scenario Description:**

This scenario applies to small farms with diversified cropping systems which will improve the current level of management in applying nutrients. Improved level of management will be such to prevent nonpoint source pollution of surface and ground waters. Typical size is less than 0.5 acres.

**Before Situation:**

Little to no soil or manure testing is being conducted and typically lacks a nutrient budget. Application of fertilizers, including manures and amendments, are conducted based upon traditional fertilizer recommendations from LGU or based on historic use rates. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion. Nutrients runoff into adjacent streams, tile drains, field surface drains, or other water courses is causing degradation to surface waters or leaching to shallow ground water sources.

**After Situation:**

Implementation Requirements have been developed to manage nutrients according to the criteria found in Nutrient Management (590) Conservation Practice Standard for either organic or non-organic operations as appropriate. A nutrient budget has been developed for each field or management zone. Nutrients are applied according to the 4 R's. (Right rate, Right time, Right place and Right source). Records needed to complete the nutrient budget are provided which may include variety of pre-season, in-season, and post-season soil nutrient and plant tissue tests and analysis; compost or manure tests; application timing, method and rate; nutrient sources; and yield data for each field or management zone. Nutrient runoff into adjacent streams is minimized improving water quality and preventing leaching into shallow ground water sources.

**Feature Measure:** planted area

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $1,267.68

**Scenario Cost/Unit:** $84.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.34 | $2.47 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 0.34 | $4.04 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 3 | $73.50 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 2 | $115.44 |

**Practice:** 590 - Nutrient Management

**Scenario** #309 - Prescription Nutrient Efficiency and Precision Application

**Scenario Description:**

The planned Precision Nutrient Efficiency and Application system will meet the current Nutrient Management (590) CPS general and additional criteria. The Application system will include soil sampling methodology for variable rate application and systems. Use of additional nutrient/soil tests including PPSN (pre-plant soil nitrate test), PSNT (pre-side dress nitrogen test), LSNT (late spring soil nitrate test), CSNT (corn stalk nitrate test) and chlorophyll meters, and/or spectral analysis may be used to further refine nutrient applications. Nitrification or urease inhibitors (as well as other Enhanced Efficiency Fertilizer technologies recognized by Land Grant Universities) may also be used. Payment for implementation is to defray the costs of Precision Nutrient Application system, grid or zone soil nutrient sampling, additional plant tissue testing and analysis, equipment to implement the practice, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

**Before Situation:**

This scenario takes a conventional cropping system where either no nutrient management or only a basic level of nutrient management is being practiced and improves it to address air quality (reduce emissions for N fertilizer) and/or minimize agricultural nonpoint source pollution of surface and groundwater. Application(s) of fertilizers, including manures and amendments, are based upon tradition and does not specifically consider the detrimental affects of improper timing or rates of nutrients, nitrous oxide emissions or excess nutrient build-up in the soil. Runoff transports nutrients and sediment to adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters. Leaching transports soluble nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site nutrient movement.

**After Situation:**

A Prescription Nutrient Efficiency and Precision Application system will be developed to meet the current Nutrient Management (590) CPS general and additional criteria. When applicable the system will also meet NOP (National Organic Program) regulations, including reducing nitrogen emissions. Implementation of the adopted efficiency system improves the 4R Stewardship installation which will reduce nutrient loss reducing the potential of off-site movement of nutrients. Utilizing GIS and GPS technologies, nutrients are applied based on soil test results for each grid or management zone using automated variable rate application equipment. The Nutrient Management Plan will include current soil test and any in-season testing results, nutrient application rates, source, timing, and placement of all nutrients applied, risk assessments and actual crop yields. Records provided annually include, the current soil test reports, planned nutrient application rates for each grid or management zone (prescription maps) and/or as applied maps, source, timing, and placement of all nutrients applied, actual crop yields and/or generated yield maps.

**Feature Measure:** acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $2,765.62

**Scenario Cost/Unit:** $69.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 2 | $216.66 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 40 | $356.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 4 | $74.20 |
| Aerial Imagery | 966 | Aerial imagery. RBG (color), infrared or NDVI single image. | Acres | $1.85 | 40 | $74.00 |
| Chlorophyll Reader | 1125 | Applicator and chlorophyll sensor includes labor. No materials | Acres | $13.59 | 40 | $543.60 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 16 | $248.00 |

**Practice:** 590 - Nutrient Management

**Scenario** #310 - Prescription Nutrient Efficiency

**Scenario Description:**

The planned Precision Nutrient Efficiency system will meet the current Nutrient Management (590) CPS general and additional criteria. Precision nutrient efficiency system involves the testing or evaluation of crop and/or soil during the growing season to more accurately determine if additional nutrient application(s) are needed. This includes methods or technologies such as PPSN (pre-plant soil nitrate test), PSNT (pre-side dress nitrogen test), LSNT (late spring soil nitrate test), CSNT (corn stalk nitrate test) and chlorophyll meters, and/or spectral analysis may be used to determine if additional nutrients are needed. Nitrification or urease inhibitors (as well as other Enhanced Efficiency Fertilizer technologies recognized by Land Grant Universities) may also be used. Payment for implementation is to defray the costs of additional soil and plant nutrient testing and analysis, in-season crop nutrient testing, equipment, labor, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

**Before Situation:**

This scenario takes a conventional cropping system where either no nutrient management or only a basic level of nutrient management is being practiced and improves it to address air quality (reduce emissions for N fertilizer) and/or minimize agricultural nonpoint source pollution of surface and groundwater. Application(s) of fertilizers, including manures and amendments, are based upon tradition and does not specifically consider the detrimental affects of improper timing or rates of nutrients, nitrous oxide emissions or excess nutrient build-up in the soil. Runoff transports nutrients and sediment to adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters. Leaching transports soluble nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site nutrient movement.

**After Situation:**

A Precision Nutrient Management Efficiency system will be developed to meet the current Nutrient Management (590) CPS general and additional criteria. When applicable the system will also meet NOP (National Organic Program) regulations, including reducing nitrogen emissions. Implementation of the adopted efficiency system improves the 4R Stewardship installation which will reduce nutrient loss reducing the potential of off-site movement of nutrients. A nutrient budget is developed for each field or management zone annually for the crop rotation or sequence. The Nutrient Management Plan will include current soil test results, nutrient application rates, source, timing, and placement of all nutrients applied, risk assessments and actual crop yields. Record keeping includes documentation of as applied nutrients by field annually plus and State record keeping requirements.

**Feature Measure:** acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $2,052.07

**Scenario Cost/Unit:** $51.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 40 | $290.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 2 | $37.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 40 | $418.80 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 4 | $98.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 2 | $20.72 |

**Practice:** 592 - Feed Management

**Scenario** #1 - Dairy - Feed Mgt

**Scenario Description:**

Feed ration management on a dairy operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients particularly phosphorus and nitrogen. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for "landlocked" farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns. Associated practices: Nutrient management (590), Prescribed Grazing (528), Forage and Biomass Planting (512), Forage Harvest Management (511)

**Before Situation:**

Producer is feeding a higher level of protein (17%) and phosphorus (0.45%) than is needed to meet National Research Council (NRC) recommendations for a herd of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.

**After Situation:**

The scenario assumes the lactating group is being evaluated. A baseline analysis and 3 quarterly reports of manure, feed, and milk analysis will be completed to determine the current nutrient inputs and outputs. The Producer will work to reduce feed protein and phosphorus levels to that of NRC recommendations for a herd of this type and at this stage of production (16% protein and 0.35% phosphorus). Producer will explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and phosphorus levels down without hurting production of the animals or profitability of the operation. Alternative feeding strategies can include things like grouping animals per similar age or stage of production, feeding based on individual rolling average production, evaluating Income over Feed Costs, as well as dry matter intake and milk nitrogen efficiencies.

**Feature Measure:** Group

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,255.92

**Scenario Cost/Unit:** $4,255.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 24 | $1,227.84 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 4 | $184.96 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $30.05 | 16 | $480.80 |
| Test, MUN Testing | 1990 | Testing nitrogen level in milk as a measure of nitrogen that will be exhibited in manure. Includes materials and shipping only. | Each | $0.42 | 4 | $1.68 |

**Practice:** 592 - Feed Management

**Scenario** #22 - Animal Group

**Scenario Description:**

Feed ration management on an animal operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for "landlocked" farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns. Associated practices: Nutrient Management (590), Prescribed Grazing (528), Forage Harvest Management (511).

**Before Situation:**

Producer is feeding a higher level of protein and/or phosphorus than is needed to meet National Research Council (NRC) recommendations for a group of animals of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.

**After Situation:**

The scenario assumes that a specific group of animals is being evaluated. A baseline analysis of 4 samples each with 4 quarterly reports of manure, and feed will be completed to determine the current inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a group of animals of this type and at this stage of production. The producer will explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and/or phosphorus levels down without hurting production of the animals or profitability of the operation. Alternative feeding strategies can include such things as grouping animals by similar age, sex, or stage of production, feeding based on individual rolling average production, or feeding "homegrown" or local feedstuffs.

**Feature Measure:** Group

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,639.52

**Scenario Cost/Unit:** $4,639.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 16 | $739.84 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $30.05 | 16 | $480.80 |

**Practice:** 592 - Feed Management

**Scenario** #38 - Feed Additive

**Scenario Description:**

Feed ration management on an animal operation by inclusion of a feed additive. The resource concerns may be water quality degradation (pathogens, soluble nutrients), air quality (odors, green house gas). The goal of the practice is to add an approved feed additive that has been proven to reduce pathogens, or tie up soluble nutrients, or improve air quality by reducing odors, ammonia, or green house gases to the animal diet. For this scenario, zeolite will be added to beef and dairy rations to reduce ammonia emissions. Associated practices: Nutrient Management (590).

**Before Situation:**

Producer is feeding a balanced diet to his animals. He knows that the diet, however is leading to resource concerns by soluble nutrients or pathogens entering the surface water from his operation, or that odors, NOx, or Methane are affecting air quality. For this scenario, the producer knows that nitrogen loss via ammonia volatilization from manure is affecting air quality and that adding zeolite to the ration will decrease this effect and improve air quality for his animals.

**After Situation:**

The scenario assumes that a specific group of animals is being evaluated for a resource concern, and that a proven feed additive can have an effect on that concern. For this particular scenario, a zeolite is added to a beef or dairy ration at a rate of 2% of the daily ration. The zeolite will absorb ammonia and other compounds, resulting in lower nitrogen excretion and thus lower ammonia emissions from the manure and result in improved air quality. Assume that one hour of general labor will be needed per year per animal unit to load/unload zeolite into feed mixing equipment. Assume that the zeolite is added based on a 2% inclusion rate of the dry matter ration of 25 pounds/day/animal unit or the amount of zeolite needed is 0.5 pounds/day/animal unit or about 0.1 tons/year/animal unit.

**Feature Measure:** Per Animal unit, per year

**Scenario Unit:** Animal Unit

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $74.47

**Scenario Cost/Unit:** $74.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Zeolite, Bulk | 2683 | Zeolite applied as a pen surface amendment or used as a feed ingredient. Zeolite is added to feed as a nutrition-based strategies or applied to pen surface as an ammonia abatement measures in livestock production, means of reducing ammonia emissions from concentrated animal feeding operations. | Ton | $422.50 | 0.1 | $42.25 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #99 - Plant Health PAMS (acs) Low Labor and Materials

**Scenario Description:**

PAMS activities with low labor and material costs will be implemented on a large scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

**After Situation:**

Planned Prevention (resistant cultivar selection, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

**Feature Measure:** Acres of Management Applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $1,033.37

**Scenario Cost/Unit:** $25.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Miscellaneous, containers, traps, etc. | 298 | Pheromone Traps, Culture container with lid. Includes materials and shipping only. | Each | $4.58 | 10 | $45.80 |
| Weather Station, Basic | 314 | Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only. | Each | $254.60 | 1 | $254.60 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #100 - Plant Health PAMS (acs) Low labor only

**Scenario Description:**

PAMS activities with low labor costs will be implemented on a large scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

**After Situation:**

Planned Prevention (resistant cultivar selection, pest habitat removal, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

**Feature Measure:** Acres of management applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $732.97

**Scenario Cost/Unit:** $18.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #101 - Pest Management Precision Ag

**Scenario Description:**

This scenario takes a conventional cropping system where either no pest management or only a basic level of pest management is being practiced and improves it to address air quality and/or minimize agricultural nonpoint sources pollution of surface and groundwater. The planned Pest Management system will meet the current Pest Management Conservation System (595) CPS general and additional criteria. Precision pest management system includes such items as pest monitoring, targeted applications, eliminates overlap, tissue testing, specialized nozzles etc. to further refine pesticide applications. Payment for implementation is to defray the costs of tissue testing, additional testing and analysis, equipment implementation of the PMCS and recordkeeping. Typical treatment area is 40 acres.

**Before Situation:**

Conventional pest management programs involve little or no monitoring and testing. Application of pesticides are completed annually based upon product salesmen recommendations that do not specifically consider the detrimental affects of inexact application methods. Fields are overwintered with little or no erosion protection often resulting in sheet, rill and ephemeral erosion. Runoff flows into adjacent streams, water courses, tile drains, field surface drains or other water courses causing degradation to receiving waters or leaching of pesticides to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil health may also be detrimentally affected.

**After Situation:**

A precision pest management system will be developed to meet the current Pest Management Conservation System (595) CPS general and additional criteria, when applicable the system will also meet NOP regulations. Development and implementation of a PMCS will benefit plant productivity while reducing potential of off-site movement of pesticides. PMCS may include practices such as use of spot applications, proper timing of applications, more appropriate formulations etc. Additional monitoring and tissue testing may also be used to further refine pesticide applications. Smart sprayer and advanced nozzle technology may also be employed. Records will be provided annually of the current monitoring, test analysis, application rates, formulations for each field including crop yields.

**Feature Measure:** Acres of management applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $3,011.86

**Scenario Cost/Unit:** $75.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Aerial Imagery | 966 | Aerial imagery. RBG (color), infrared or NDVI single image. | Acres | $1.85 | 40 | $74.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 14 | $1,851.92 |
| **Materials** | | | | | | |
| Miscellaneous, containers, traps, etc. | 298 | Pheromone Traps, Culture container with lid. Includes materials and shipping only. | Each | $4.58 | 4 | $18.32 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 1 | $24.50 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #102 - Plant Health PAMS activities (Small Farm - each) labor, materials and mitigation.

**Scenario Description:**

PAMS activities with labor and material costs plus mitigation will be implemented on a small scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation over 30 points.

**After Situation:**

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation over 30 points.

**Feature Measure:** Small farm, typically = 5Ac

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,491.71

**Scenario Cost/Unit:** $9,491.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 27 | $1,381.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 17 | $2,248.76 |
| **Materials** | | | | | | |
| Miscellaneous, containers, traps, etc. | 298 | Pheromone Traps, Culture container with lid. Includes materials and shipping only. | Each | $4.58 | 3 | $13.74 |
| Weather Station, Basic | 314 | Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only. | Each | $254.60 | 1 | $254.60 |
| Netting, Crop Protection, Large Mesh | 2762 | Synthetic netting, large mesh to exclude birds and small animals. Approximately 6 to 7 inch mesh. Includes materials and shipping only. | Square Feet | $0.06 | 87120 | $5,227.20 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #103 - Plant Health PAMS (acs) High labor only (intensive scouting etc.)

**Scenario Description:**

Plant Health PAMS (acs) High labor only (intensive scouting etc.)

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

**After Situation:**

Planned Prevention (resistant cultivar selection, pest habitat removal, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

**Feature Measure:** Acres of Management Applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $2,299.93

**Scenario Cost/Unit:** $57.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #104 - Plant health PAMS (Small Farm - each) labor and mitigation.

**Scenario Description:**

PAMS activities with labor costs will be implemented plus mitigation on a small scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation up to 30 points.

**After Situation:**

Planned Prevention (resistant cultivar selection, pest habitat removal, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation up to 30 points.

**Feature Measure:** Small farm, typically = 5Ac

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,272.85

**Scenario Cost/Unit:** $2,272.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 14 | $716.24 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 9 | $1,190.52 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #105 - Plant Health PAMS (acs) High Labor, materials and mitigation.

**Scenario Description:**

PAMS activities with high labor and material costs (weather station, netting, field sanitation, mating disruption) plus mitigation will be implemented on a large scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation over 30 points.

**After Situation:**

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation over 30 points.

**Feature Measure:** Acres of management applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $20,576.82

**Scenario Cost/Unit:** $514.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 150 | $9,499.50 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 15 | $767.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 150 | $4,833.00 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 30 | $1,605.30 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 22 | $2,910.16 |
| **Materials** | | | | | | |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #106 - Plant Health PAMS (acs) Low Labor, materials and mitigation.

**Scenario Description:**

PAMS activities with low labor and material costs will be implemented plus mitigation on a large scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation up to 30 points.

**After Situation:**

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation up to 30 points.

**Feature Measure:** Acres of Management Applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $2,927.69

**Scenario Cost/Unit:** $73.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 14 | $1,851.92 |
| **Materials** | | | | | | |
| Miscellaneous, containers, traps, etc. | 298 | Pheromone Traps, Culture container with lid. Includes materials and shipping only. | Each | $4.58 | 10 | $45.80 |
| Weather Station, Basic | 314 | Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only. | Each | $254.60 | 1 | $254.60 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #107 - Water Quality Pesticide Mitigation > 30 Point AND/OR Beneficial Insect Pesticide Mitigation - Small Farm

**Scenario Description:**

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is > 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

**After Situation:**

An IPM system with planned. Mitigation techniques (>30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND Agronomy Technical Note 9).

**Feature Measure:** Small Farm, typically <= 5 acs

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,478.28

**Scenario Cost/Unit:** $2,478.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 20 | $1,023.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 11 | $1,455.08 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #108 - Plant Health PAMS (acs) High Labor and materials

**Scenario Description:**

PAMS activities with high labor and material costs will be implemented on a large scale crop production area (weather station, netting, field sanitation, mating disruption etc.).

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

**After Situation:**

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

**Feature Measure:** Acres of Management Applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $17,957.50

**Scenario Cost/Unit:** $448.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 150 | $9,499.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 150 | $4,833.00 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 30 | $1,605.30 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #109 - Water Quality Pesticide Mitigation = 30 Point AND/OR Beneficial Insect Pesticide Mitigation - Small Farm

**Scenario Description:**

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is = 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

**After Situation:**

An IPM system with planned. Mitigation techniques (=30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND/OR Agronomy Technical Note 9).

**Feature Measure:** Small Farm, typically <= 5 acres

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,509.92

**Scenario Cost/Unit:** $1,509.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 14 | $716.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #110 - Water Quality Pesticide Mitigation > 30 Point AND/OR Beneficial Insect Pesticide Mitigation

**Scenario Description:**

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is > 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

**After Situation:**

An IPM system with planned. Mitigation techniques (>30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND/OR Agronomy Technical Note 9).

**Feature Measure:** Acres of Management Applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $3,413.00

**Scenario Cost/Unit:** $85.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 15 | $767.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #111 - Water Quality Pesticide Mitigation = 30 Point AND/OR Beneficial Insect Pesticide Mitigation

**Scenario Description:**

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is = 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

**After Situation:**

An IPM system with planned. Mitigation techniques (=30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND Agronomy Technical Note 9).

**Feature Measure:** Acres of Management Applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $1,945.48

**Scenario Cost/Unit:** $48.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 7 | $358.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #112 - Plant health PAMS (Small Farm - each) labor only

**Scenario Description:**

PAMS activities with labor costs will be implemented on a small scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

**After Situation:**

Planned Prevention (resistant cultivar selection, pest habitat removal, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

**Feature Measure:** Small farm, typically <= 5 ac

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $681.81

**Scenario Cost/Unit:** $681.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |

**Practice:** 595 - Pest Management Conservation System

**Scenario** #113 - Plant Health PAMS activities (Small Farm - each) labor and materials

**Scenario Description:**

PAMS activities with labor and material costs will be implemented on a small scale crop production area.

**Before Situation:**

Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

**After Situation:**

Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc. ), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc. ), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

**Feature Measure:** Small Farm, typically <= 5 ac

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,177.35

**Scenario Cost/Unit:** $6,177.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Miscellaneous, containers, traps, etc. | 298 | Pheromone Traps, Culture container with lid. Includes materials and shipping only. | Each | $4.58 | 3 | $13.74 |
| Weather Station, Basic | 314 | Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only. | Each | $254.60 | 1 | $254.60 |
| Netting, Crop Protection, Large Mesh | 2762 | Synthetic netting, large mesh to exclude birds and small animals. Approximately 6 to 7 inch mesh. Includes materials and shipping only. | Square Feet | $0.06 | 87120 | $5,227.20 |

**Practice:** 600 - Terrace

**Scenario** #1 - Gradient Terrace

**Scenario Description:**

An earthen embankment with channel is constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. A gradient terrace having 5:1 upstream and 5:1 downstream slopes in a field with slopes from 2% to 8% is constructed. Water is safely conducted to a grassed waterway or underground outlet. Erosion is reduced by slowing, collecting, and redistributing runoff to a stable outlet. Excessive sediment is trapped in the terrace reducing sediment in surface waters. Associated practices: Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Before Situation:**

A field with slopes 2% to 8% and silt loam soils has excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of gradient terraces measuring 750 in length, 2.5 feet average height, and 5:1 front and back slopes is installed with spacing designed to intercept the flow of water and shorten slope length to reduce erosion to acceptable levels. The terrace is installed with a dozer, scraper, or road grader is used. The installed terrace is typically farmed.

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 750.00

**Scenario Total Cost:** $3,703.53

**Scenario Cost/Unit:** $4.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 18 | $1,816.92 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 694 | $631.54 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 18 | $896.58 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 600 - Terrace

**Scenario** #2 - Storage Terrace

**Scenario Description:**

An earthen embankment with channel is constructed across the field slope as part of a system to shorten slope lengths, and reduce sheet, rill, and gully erosion in a cropped field. A storage terrace with side slopes of 8:1 or greater in a field with slopes from 2% to 8% is constructed. Water is safely stored before being safely conducted to a grassed waterway or underground outlet. Erosion is reduced by slowing, collecting, and redistributing runoff to a stable outlet. Excessive sediment is trapped in the terrace reducing sediment in surface waters. Associated practices: Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Before Situation:**

A field with slopes 2% to 8% and silt loam soils has excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of flat channel (level) terraces with approximately 8:1 front and back slopes, 2.5 feet average height, and 750 feet in length is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. The terrace is installed with a dozer, scraper, or road grader is used. The installed terrace is typically farmed. The riser and outlet are not included and are covered through associated practices.

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 750.00

**Scenario Total Cost:** $5,040.10

**Scenario Cost/Unit:** $6.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 24 | $2,422.56 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1110 | $1,010.10 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 600 - Terrace

**Scenario** #3 - Rebuild, Gradient Terrace

**Scenario Description:**

A previously constructed earthen embankment with a channel across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field is beyond the practice life span, no longer functioning as designed, and needs to be reconstructed. A gradient terrace having 5:1 upstream and 5:1 downstream slopes in a field with slopes from 2% to 8% is constructed. Water is safely conducted to a grassed waterway or underground outlet. Excessive sediment is trapped in the terrace reducing sediment in surface waters. Associated practice: Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Before Situation:**

A field with slopes 2% to 8% and silt loam soils has excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of gradient terraces measuring 750 feet in length, 2.5 feet average height, and 5:1 front and back slopes is re-installed with spacing designed to intercept the flow of water and shorten slope length to reduce erosion to acceptable levels. The terrace is installed with a dozer, scraper, or road grader is used. The installed terrace is typically farmed.

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 750.00

**Scenario Total Cost:** $2,221.00

**Scenario Cost/Unit:** $2.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 12 | $1,211.28 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 600 - Terrace

**Scenario** #4 - Rebuild, Storage Terrace

**Scenario Description:**

A previously constructed earthen embankment with a channel across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field is beyond the practice life span, no longer functioning as designed, and needs to be reconstructed. A storage terrace with side slopes of 8:1 or greater in a field with slopes from 2% to 8% is constructed. Water is safely stored before being safely conducted to a grassed waterway or underground outlet. Erosion is reduced by slowing, collecting, and redistributing runoff to a stable outlet. Excessive sediment is trapped in the terrace reducing sediment in surface waters. Associated practices: Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Before Situation:**

A field with slopes 2% to 8% and silt loam soils has excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of flat channel (level) terraces measuring 750 feet in length, 2.5 feet average height, and 8:1 front and back slopes is re-installed with spacing designed to intercept the flow of water and shorten slope length to reduce erosion to acceptable levels. The terrace is installed with a dozer, scraper, or road grader is used. The installed terrace is typically farmed. The riser and outlet are not included and are covered through associated practices.

**Feature Measure:** Length of terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 750.00

**Scenario Total Cost:** $3,125.50

**Scenario Cost/Unit:** $4.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 18 | $1,816.92 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 18 | $896.58 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 600 - Terrace

**Scenario** #38 - Broadbased

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a broadbased terrace having 5:1 upstream and 5:1 downstream slopes measuring 2,500 feet in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Channel and berm are farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of broadbased terraces measuring 2,500 feet in length, 2.5 height, and 5:1 front and back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $5,698.03

**Scenario Cost/Unit:** $2.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 34 | $3,431.96 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 34 | $1,693.54 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 600 - Terrace

**Scenario** #39 - Flat Channel

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths, and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a flat channel (level) terrace storing runoff with a length of 2,500 feet and side slopes of 8:1 or greater in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of flat channel (level) terraces with approximately 8:1 front and back slopes, 2.5 feet height, and 2,500 feet in length is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $9,272.30

**Scenario Cost/Unit:** $3.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 57 | $5,753.58 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 57 | $2,839.17 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 600 - Terrace

**Scenario** #40 - Grass Backed

**Scenario Description:**

{Only name change from 5 to 1 & 2 to 1 to Grass Back} An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of terraces (2,500 feet in length) that have one relatively flat (5:1) slope and one steep (2:1) slope constructed in a field with slopes from 2% to 8% installed in loam soils or similar soils in regards to workability. The steep slope is established to permanent vegetation with the flatter slope farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Seeding is not included. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of terraces with one steep (2:1) and one flat (5:1) slope measuring 2,500 feet in length and 2.5' height is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $3,276.25

**Scenario Cost/Unit:** $1.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 19 | $1,917.86 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 19 | $946.39 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 600 - Terrace

**Scenario** #41 - Narrow Base, less than 8% slope

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of narrow base terraces with 2:1 slopes, 2,500' length, and 2.5' height in a field with slopes from 3% to 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Seeding is not included. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of narrow base terraces with approximately 2:1 front and back slopes measuring 2,500 feet in length and 2.5 feet height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $4,030.00

**Scenario Cost/Unit:** $1.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 24 | $2,422.56 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 600 - Terrace

**Scenario** #42 - Narrow Base, greater than 8% slope

**Scenario Description:**

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of narrow base terraces with 2:1 slopes, 2,500' length, and 2.5' height in a field with slopes exceeding 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Seeding is not included. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of narrow base terraces with approximately 2:1 front and back slopes measuring 2,500 feet in length and 2.5' height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

**Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,500.00

**Scenario Total Cost:** $4,385.01

**Scenario Cost/Unit:** $1.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 26 | $2,624.44 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 26 | $1,295.06 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 601 - Vegetative Barrier

**Scenario** #2 - Seeded Barrier

**Scenario Description:**

Permanent strips of stiff, dense vegetation established along the general contour of slopes.

**Before Situation:**

Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

**After Situation:**

Implementation Requirements are prepared and implemented for the site according to the Vegetative Barrier (601) standard. A strip or strips of stiff, dense vegetation is established by seeding along the general contour of the slope that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

**Feature Measure:** Per 1000 Linear feet of practice ins

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $184.57

**Scenario Cost/Unit:** $0.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.09 | $1.19 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.09 | $2.00 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 0.09 | $0.82 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.09 | $11.42 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 601 - Vegetative Barrier

**Scenario** #3 - Vegetative Planting

**Scenario Description:**

Permanent strips of stiff, dense vegetation established along the general contour of slopes.

**Before Situation:**

Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

**After Situation:**

Implementation Requirements are prepared and implemented for the site according to the Vegetative Barrier (601) standard. A strip or strips of stiff, dense vegetation such as Vetiver Grass is/are established along the general contour of the slope that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

**Feature Measure:** Per 100 foot Linear feet of practice

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $126.08

**Scenario Cost/Unit:** $1.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.01 | $0.06 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.01 | $0.07 |
| Ground sprigging | 1101 | Includes costs for equipment, power unit and labor. | Acres | $71.71 | 0.01 | $0.72 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Sulfate | 70 | Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.60 | 0.46 | $0.74 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 0.01 | $0.17 |
| Perennial Grass, Legume, and/or Forb Culms, Stems, Liners, or Plugs, linear planting | 2324 | Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including culms, stems, liners, or plugs. Cost is for 100 linear feet. Includes materials and shipping. | 100 Foot | $124.33 | 1 | $124.33 |

**Practice:** 601 - Vegetative Barrier

**Scenario** #9 - Caribbean and Virgin Island Veg Barriers with Cuttings

**Scenario Description:**

Permanent strips of stiff, dense vegetation established along the general contour of slopes.

**Before Situation:**

Significant erosion is occurring resulting in substantial sheet and rill erosion. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways, and the soil resource is degraded.

**After Situation:**

Implementation Requirements for 601 are prepared for the unique site conditions and the practice is implemented. A strip or strips of stiff, dense vegetation such as Vetivier Grass is/are established along the general contour of the slope that effectively settles a significant amount or sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

**Feature Measure:** Length treated

**Scenario Unit:** 100 Foot

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $558.03

**Scenario Cost/Unit:** $558.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 2 | $189.02 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Site Preparation, Mechanical | 944 | Aerator, rolling drum chopper, etc. Includes equipment, power unit and labor costs. | Acres | $95.23 | 0.01 | $0.95 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| **Materials** | | | | | | |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 1 | $1.01 |
| Perennial Grass, Legume, and/or Forb Culms, Stems, Liners, or Plugs, linear planting | 2324 | Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including culms, stems, liners, or plugs. Cost is for 100 linear feet. Includes materials and shipping. | 100 Foot | $124.33 | 1 | $124.33 |

**Practice:** 601 - Vegetative Barrier

**Scenario** #10 - Pac. Island Area Vegetative Barrier

**Scenario Description:**

Permanent strips of stiff, dense vegetation established along the general contour of slopes.

**Before Situation:**

Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

**After Situation:**

Implementation Requirements are prepared for the site according to the 601 Vegetative Barrier Standard and is implemented. A strip or strips of stiff, dense vegetation such as Vetivier Grass is/are established along the general contour of the slope that effectively settles a significant amount or sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

**Feature Measure:** Linear feet planted

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $1,554.57

**Scenario Cost/Unit:** $1.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Perennial Grass, Legume, and/or Forb Culms, Stems, Liners, or Plugs, linear planting | 2324 | Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including culms, stems, liners, or plugs. Cost is for 100 linear feet. Includes materials and shipping. | 100 Foot | $124.33 | 10 | $1,243.30 |

**Practice:** 601 - Vegetative Barrier

**Scenario** #11 - Pacific Islands Area - Vegetative Barrier for Small Area

**Scenario Description:**

Permanent strips of stiff, dense vegetation established along the general contour of slopes for small areas needing erosion control.

**Before Situation:**

Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

**After Situation:**

Implementation Requirements are prepared for the site according to the 601 Vegetative Barrier Standard and is implemented. A strip or strips of stiff, dense vegetation of a warm season grass established along the general contour of the slope that effectively settles a significant amount or sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

**Feature Measure:** Number of 100 ft segments

**Scenario Unit:** 1,000 Foot

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,425.69

**Scenario Cost/Unit:** $1,425.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Perennial Grass, Legume, and/or Forb Culms, Stems, Liners, or Plugs, linear planting | 2324 | Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including culms, stems, liners, or plugs. Cost is for 100 linear feet. Includes materials and shipping. | 100 Foot | $124.33 | 10 | $1,243.30 |

**Practice:** 603 - Herbaceous Wind Barriers

**Scenario** #1 - Annual Species

**Scenario Description:**

This scenario describes the implementation of herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of annual vegetation, living or dead. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology.

**Before Situation:**

Typically cropland has excessive soil disturbance and unsheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

**After Situation:**

Implementation of herbaceous wind barriers will modify the flow and velocity of air dependant upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss; protect growing plants from damage by wind blown soil particles, provide food and cover for wildlife. Payment is for the design and implementation of annual barriers and required reestablishment.

**Feature Measure:** Length of wind barrier

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $275.84

**Scenario Cost/Unit:** $0.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 0.09 | $3.30 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 1 | $57.24 |

**Practice:** 603 - Herbaceous Wind Barriers

**Scenario** #1 - Cool Season Annual/Perennial Species

**Scenario Description:**

This scenario describes the implementation of herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of cool season annual or perennial vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology.

**Before Situation:**

Typically cropland has excessive soil disturbance and unsheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

**After Situation:**

Implementation Requirements will be prepared and implemented for the site according to the Herbaceous Wind Barrier (603) standard. Implementation of herbaceous wind barriers will modify the flow and velocity of air dependent upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss, protect growing plants from damage by wind-blown soil particles, and provide food and cover for wildlife. The scenario includes the design and implementation of annual barriers and required reestablishment.

**Feature Measure:** linear feet of barrier planted

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $275.84

**Scenario Cost/Unit:** $0.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 0.09 | $3.30 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 1 | $57.24 |

**Practice:** 603 - Herbaceous Wind Barriers

**Scenario** #6 - Small Farm Herbaceous Barrier

**Scenario Description:**

This scenario describes the annual implementation of herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of annual living vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology. Establishment is done either by using light tillage or chemical application and no till drill.

**Before Situation:**

Typically cropland has excessive soil disturbance and un-sheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

**After Situation:**

Implementation Requirements will be prepared for the site according to the 603 Herbaceous Wind Barrier Standard and implemented. Implementation of herbaceous wind barriers will modify the flow and velocity of air dependent upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss; protect growing plants from damage by wind blown soil particles, provide food and cover for wildlife. Payment is for the design and implementation of annual barriers and required reestablishment.

**Feature Measure:** Linear Feet Planted

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $352.36

**Scenario Cost/Unit:** $0.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.5 | $11.14 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.5 | $63.46 |

**Practice:** 603 - Herbaceous Wind Barriers

**Scenario** #7 - Pacific Island Area Herbaceous Wind Barriers

**Scenario Description:**

This is for the Pacific Island Area. This scenario describes implementation of warm or cool season perennial herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of annual living vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology. Establishment is done either by using light tillage or chemical application and no till drill.

**Before Situation:**

Typically cropland has excessive soil disturbance and unsheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

**After Situation:**

Implementation Requirements will be prepared for the site according to the 603 Herbaceous Wind Barrier Standard and implemented. Implementation of perennial herbaceous wind barriers will modify the flow and velocity of air dependent upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss; protect growing plants from damage by wind blown soil particles, provide food and cover for wildlife. Payment is for the establishment of perennial barriers and required reestablishment.

**Feature Measure:** Feet extablished

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $121.40

**Scenario Cost/Unit:** $0.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.06 | $0.79 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.06 | $1.34 |
| **Foregone Income** | | | | | | |
| FI, Soybeans Irrigated | 1962 | Irrigated Soybeans is Primary Crop | Acres | $544.12 | 0.02 | $10.88 |
| FI, Wheat Irrigated | 1964 | Irrigated Wheat is Primary Crop | Acres | $386.53 | 0.02 | $7.73 |
| FI, Vegetables | 2033 | Vegetables is Primary Crop | Acres | $1,505.34 | 0.02 | $30.11 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2757 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $227.14 | 0.06 | $13.63 |

**Practice:** 604 - Saturated Buffer

**Scenario** #5 - Saturated Buffer

**Scenario Description:**

Water discharging from a subsurface drainage system is dispersed along a buffer strip (often a riparian buffer). The water flows underground through the buffer area where nutrients and sediment can be removed before the water reaches the stream. Resource Concerns: Water Quality Degradation (Nutrients) Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management; 587 - Structure for Water Control

**Before Situation:**

Water from a subsurface drainage system flows directly into a stream, carrying sediment and nutrients.

**After Situation:**

Water from a subsurface drainage system is dispersed through at 400 feet of 5" HDPE single wall perforated pipe tile drain along an established vegetated buffer strip at least 30 feet from the receiving stream. Drainage pipe is trenched in at 4 feet depth. The water is detained by passing underground where the nitrogen is removed by bacteria and natural processes.

**Feature Measure:** Length of Dispersal conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 400.00

**Scenario Total Cost:** $3,720.61

**Scenario Cost/Unit:** $9.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 400 | $612.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 1 | $53.21 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Pipe, HDPE, 5 in., PCPT, Single Wall | 1271 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5 inch diameter - ASTM F405. Material cost only. | Feet | $0.98 | 400 | $392.00 |
| Water Level Control Structure, Inline, 2 Baffle, 10 in. diameter | 2021 | Inline inlet WCS 6 ft. high x 10 in. diameter connections, 2 baffle (3 compartments) | Each | $2,034.99 | 1 | $2,034.99 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 605 - Denitrifying Bioreactor

**Scenario** #7 - Denitrifying Bioreactor

**Scenario Description:**

"Scenario describes a structure containing a carbon source installed to intercept subsurface drain (tile) flow or ground water, and reduce the concentration of nitrate-nitrogen. Woodchips serve as the carbon source necessary to the denitrification process. This bioreactor has geotextile fabric (or polyethylene - PE) between the wood chips and the surrounding soil plus the following components: woodchip filled pit, two water control structures (to allow management of the flow rate and and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario."

**Before Situation:**

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

**After Situation:**

Bioreactor has geotextile fabric (or polyethylene - PE) between the wood chips and the surrounding soil plus the following components: woodchip filled pit, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. The approximate bioreactor excavated pit volume is 333 cubic yards (e.g. 6 feet deep, 15 feet wide and 100 feet long). Woodchips occupy the 6 feet of the pit plus 10% crowned (366 cu. yd.) and will be mounded above ground level to shed precipitation. A geotextile fabric (or PE material) surrounds the chips to prevent migration of soil into the pit. Water control structures should be installed using practice standard (587) Structure for Water Control. Two inline water control structures are in place. Upper WCS connected to the upper 6" diameter single-wall CPT manifold pipe (15' each, note that 6' HDPE dual wall is the only type available and used in the scenario components) by 6" diameter dual wall pipe (20' each). 20' of 6" dual wall pipe connects the downstream manifold to the lower WCS which is connected back to the main with additional 20' of 6" dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. 40' of mainline is replaced with non-perforated 10' above and below the upper WCS. The soil excavated from the pit is spoiled onto the nearby field. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554).

**Feature Measure:** Volume of Pit excavation

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 333.00

**Scenario Total Cost:** $29,752.24

**Scenario Cost/Unit:** $89.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 807 | $1,145.94 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 333 | $852.48 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 333 | $1,208.79 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 366 | $20,668.02 |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $4.02 | 50 | $201.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.69 | 90 | $152.10 |
| Water Level Control Structure, Inline, 2 Baffle, 10 in. diameter | 2021 | Inline inlet WCS 6 ft. high x 10 in. diameter connections, 2 baffle (3 compartments) | Each | $2,034.99 | 1 | $2,034.99 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only. | Each | $342.72 | 1 | $342.72 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $17.29 | 60 | $1,037.40 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10 in. | 2204 | Pipe, Corrugated HDPE Double Wall 10 inch diameter with water tight joints meeting ASTM F477. Material cost only. | Feet | $11.46 | 40 | $458.40 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 605 - Denitrifying Bioreactor

**Scenario** #8 - Denitrifying Bioreactor, No Liner

**Scenario Description:**

"Scenario describes a structure containing a carbon source installed to intercept subsurface drain (tile) flow or ground water, and reduce the concentration of nitrate-nitrogen. Woodchips serve as the carbon source necessary to the denitrification process. This bioreactor has the following components: woodchip filled pit, a soil cover, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario.

**Before Situation:**

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

**After Situation:**

Bioreactor has the following components: woodchip filled pit, a soil cover, two water control structures (to allow management of the flow rate and free water elevation within the bioreactor), and piping to convey water to and from the bioreactor. The approximate bioreactor excavated pit volume is 333 cubic yards (e.g. 6 feet deep, 15 feet wide and 100 feet long). Woodchips occupy the lower 4 feet of the pit (222 cu. yd.) and a soil blanket over the woodchips is 2.0 ft. and will be mounded above ground level to shed precipitation. A geotextile fabric (or PE material) surrounds the chips to prevent migration of soil into the pit. Water control structures should be installed using practice standard (587) Structure for Water Control. Two inline water control structures are in place. Upper WCS connected to the upper 6' diameter single-wall CPT manifold pipe (15' each, note that 6' HDPE dual wall is the only type available and used in the scenario components) by 6' diameter dual wall pipe (20' each). 20' of 6' dual wall pipe connects the downstream manifold to the lower WCS which is connected back to the main with additional 20' of 6' dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. 40' of mainline is replaced with non-perforated 10' above and below the upper WCS. The soil excavated from the pit is spoiled onto the nearby field. Associated practices: Subsurface Drain (606), Structure for Water Control (587), Drainage Water Management (554).

**Feature Measure:** Volume of Carbon Source

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 222.00

**Scenario Total Cost:** $19,529.03

**Scenario Cost/Unit:** $87.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 333 | $852.48 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 200 | $726.00 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 222 | $12,536.34 |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $4.02 | 50 | $201.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.69 | 90 | $152.10 |
| Water Level Control Structure, Inline, 2 Baffle, 10 in. diameter | 2021 | Inline inlet WCS 6 ft. high x 10 in. diameter connections, 2 baffle (3 compartments) | Each | $2,034.99 | 1 | $2,034.99 |
| Water Control Structure, Stoplog, Inline, fixed costs portion | 2145 | Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only. | Each | $342.72 | 1 | $342.72 |
| Water Control Structure, Stoplog, Inline, variable cost portion | 2146 | Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only. | Height x Diameter | $17.29 | 60 | $1,037.40 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10 in. | 2204 | Pipe, Corrugated HDPE Double Wall 10 inch diameter with water tight joints meeting ASTM F477. Material cost only. | Feet | $11.46 | 40 | $458.40 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 606 - Subsurface Drain

**Scenario** #1 - Corrugated Plastic Pipe, Single Wall, Less than or equal to 6 inches

**Scenario Description:**

A perforated HDPE (Corrugated Plastic Pipe) pipeline less than or equal to 6 inches in diameter is installed below ground using a drainage plow to address excess water (seasonal high water table), degraded plant condition, and water quality degradation (nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

**Before Situation:**

Soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations.

**After Situation:**

A perforated HDPE (Corrugated Plastic Pipe) pipeline less than or equal to 6 inches in diameter is installed below ground using a drainage plow to address excess water (seasonal high water table), degraded plant condition, and water quality degradation (nutrients). A 5" single wall, perforated HDPE Corrugated Plastic Pipe (CPP) is installed below ground to a minimum depth of 5 feet. The typical number of mainline connections for 1,000 feet of subsurface drainline is 3. The drainage modifications result in reduced plant stress due to excess wetness or improved drainage water quality due to system retrofit enabling drainage water management.

**Feature Measure:** Feet of Pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $5,493.56

**Scenario Cost/Unit:** $5.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, tile line plowing, earth, 60 in. | 1457 | Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling. | Feet | $2.61 | 1000 | $2,610.00 |
| **Materials** | | | | | | |
| Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound | 1380 | High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only. | Pound | $2.63 | 500 | $1,315.00 |
| Drainage Lateral Connection | 1458 | Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee. | Each | $35.12 | 3 | $105.36 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 606 - Subsurface Drain

**Scenario** #2 - Enveloped Corrugated Plastic Pipe, Single Wall, Less than or equal to 6 inches

**Scenario Description:**

A perforated HDPE (Corrugated Plastic Pipe) pipeline less than or equal to 6 inches in diameter is installed with a sand-gravel envelope below ground using a drainage plow to address excess water (seasonal high water table), degraded plant condition, and water quality degradation (nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management, Grass Waterway;412, 620- Underground Outlet;313- Waste Storage Structure

**Before Situation:**

Soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations.

**After Situation:**

A perforated HDPE (Corrugated Plastic Pipe) pipeline less than or equal to 6 inches in diameter is installed with a sand-gravel envelope below ground using a drainage plow to address excess water (seasonal high water table), degraded plant condition, and water quality degradation (nutrients). A 5” single wall, perforated HDPE Corrugated Plastic Pipe (CPP) is installed below ground to a minimum depth of 5 feet. The line is surrounded with a sand-gravel envelope. The typical volume sand-gravel for 1,000 feet of 12"wide x 12" high envelope is 32 cubic yards. The typical number of mainline connections for 1,000 feet of subsurface drainline is 3. The drainage modifications result in reduced plant stress due to excess wetness or improved drainage water quality due to system retrofit enabling drainage water management.

**Feature Measure:** Feet of Pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $6,517.64

**Scenario Cost/Unit:** $6.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 4 | $378.04 |
| Trenching, Earth, 12 in. x 60 in. | 1459 | Trenching, earth, 12 inch wide x 60 inch depth, includes equipment and labor for trenching, laying 3 to 6 inch CPP drain line with envelope, and backfilling. | Feet | $2.06 | 1000 | $2,060.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 32 | $996.80 |
| Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound | 1380 | High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only. | Pound | $2.63 | 500 | $1,315.00 |
| Drainage Lateral Connection | 1458 | Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee. | Each | $35.12 | 3 | $105.36 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 606 - Subsurface Drain

**Scenario** #3 - Corrugated Plastic Pipe , less than 8 inches, Buried 8 feet or more

**Scenario Description:**

A perforated HDPE, Corrugated Plastic Pipe is installed with a stone drain using a hydraulic excavator. The depth of excavation can range from 8 to 15 feet deep. The drain is installed upslope of a proposed waste storage facility to intercept subsurface water flow. Failure to collect the flow could impair the integrity of proposed waste storage facility. Associated Practices: 313 - Waste Storage Facility, 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management, 620 Underground Outlet.

**Before Situation:**

Soil conditions are excessively wet in the spring due to poor internal soil drainage. An earthen waste storage facility is planned, which will be vulnerable to failure from excess soil water upslope of the impoundment.

**After Situation:**

A 4” perforated HDPE (Corrugated Plastic Pipe) pipeline is installed with a stone drain using a hydraulic excavator. A 12 feet deep trench is backfilled with a gravel drain. The drain is 2 feet wide by 8 feet high and runs the length of the project. The drainage modifications result in reduced risk of failure of the waste storage facility since the excessive moisture is now collected and carried around the structure to a safe outlet.

**Feature Measure:** Feet of Pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $13,027.24

**Scenario Cost/Unit:** $26.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 12 | $1,596.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 296 | $9,220.40 |
| Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound | 1380 | High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only. | Pound | $2.63 | 150 | $394.50 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 606 - Subsurface Drain

**Scenario** #20 - Corrugated Plastic Pipe (CPP), Single-Wall, >= 8 inch (with 2'x3' gravel envelope)

**Scenario Description:**

Install 1,000 feet of 12-inch, Single-Wall, HDPE Corrugated Plastic Pipe (CPP) with a 2'x3' gravel envelope below ground to a typical depth of 5 feet using (2) medium size excavators and a triaxle dump truck. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

**Before Situation:**

Soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

**After Situation:**

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

**Feature Measure:** Length of Pipe

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $18,339.57

**Scenario Cost/Unit:** $18.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 24 in. x 60 in. | 1460 | Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling. | Feet | $4.02 | 1000 | $4,020.00 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 222 | $6,915.30 |
| Pipe, HDPE, 12 in., PCPT, Single Wall | 1274 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12 inch diameter - ASTM F667. Material cost only. | Feet | $6.07 | 1000 | $6,070.00 |
| Drainage Lateral Connection | 1458 | Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee. | Each | $35.12 | 10 | $351.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 606 - Subsurface Drain

**Scenario** #21 - Corrugated Plastic Pipe (CPP), Single-Wall, >=8 inch (No Gravel)

**Scenario Description:**

Install 1,000 feet of 10-inch, Single-Wall, HDPE Corrugated Plastic Pipe (CPP) below ground at a typical depth of 4 feet using an excavator or backhoe. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is causing crop stress and delay of field operations (seed bed preparation, planting, etc.).

**After Situation:**

The drainage modifications result in reduced plant stress due to excessive wetness caused by a seasonal high water table, or improved drainage water quality due to system retrofit enabling drainage water management.

**Feature Measure:** Length of Pipe

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $9,246.34

**Scenario Cost/Unit:** $9.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1000 | $3,250.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Pipe, HDPE, 10 in., PCPT, Single Wall | 1273 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 10 inch diameter - ASTM F667. Material cost only. | Feet | $4.82 | 1000 | $4,820.00 |
| Drainage Lateral Connection | 1458 | Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee. | Each | $35.12 | 10 | $351.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 607 - Surface Drain, Field Ditch

**Scenario** #4 - Field Drainage Ditch

**Scenario Description:**

This scenario is the construction of a surface drain, field ditch. Typical construction dimensions are 4' bottom x 2.5' deep x 1320' length with a side slope of 3:1. Excess water is either reused in an Irrigation System, Tailwater Recovery (447) system, or conveyed to a receiving water body. Resource concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water and Water Quality Degradation - Excessive Sediment in Surface Waters. Associated Conservation Practices: 608-Surface Drain, Main or Lateral; 587 -Structure For Water Control; 554 - Drainage Water Management

**Before Situation:**

Excess water has no outlet and backs up into the fields causing damage or loss of the crop.

**After Situation:**

An earthen ditch that follows the natural slope of the land at the low end of the field will be constructed to carry excess water to an outlet.

**Feature Measure:** Volume of Earth Excavated

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 1,406.00

**Scenario Total Cost:** $3,937.64

**Scenario Cost/Unit:** $2.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 1406 | $3,599.36 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 608 - Surface Drain, Main or Lateral

**Scenario** #3 - Main or Lateral Drainage Ditch

**Scenario Description:**

This scenario is the construction of a surface drain, main or lateral. Typical construction dimensions are 4' wide bottom x 4' deep x 1320' length with a side slope of 2.5:1. Resource Concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water and Water Quality Degradation - Excessive Sediment in Surface Waters. Associated Conservation Practices: 607-Surface Drain, Field Ditch; 587 -Structure For Water Control; 554 Drainage Water Management

**Before Situation:**

Excess water has no outlet and backs up into the fields causing damage or loss of the crop.

**After Situation:**

An earthen ditch that follows the natural slope of the land at the low end of the field is constructed to carry excess water to an outlet so that water no longer backs up into the field so that field production is improved.

**Feature Measure:** Volume of Earth Excavated

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,738.00

**Scenario Total Cost:** $7,178.42

**Scenario Cost/Unit:** $2.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 2738 | $7,009.28 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #1 - Individual Hardwood Trees with Shelters

**Scenario Description:**

Hardwood Tree seedlings will be hand planted in the forested area where few or no forest trees are growing. The existing stand of trees needs under-planting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are planted at a rate of 201 to 300 trees per acre Seedlings are protected from environmental impacts. Wildlife habitat is degraded by loss of forest conditions. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490), Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: • Degraded plant condition: inadequate structure and composition • Degraded plant condition: undesirable plant productivity and health • Inadequate habitat for fish and wildlife: habitat degradation • Soil erosion: sheet, rill, and wind erosion • Air quality impacts: emissions of greenhouse gases - GHGs

**Before Situation:**

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 10 acres, and the objectives of the landowner are met. All planted trees are protected from environmental impacts by shelters (solid tree tubes or wire cages). Post-planting competing vegetation control is planned to ensure seedling survival. A forest will provide wildlife habitat, provide a long-term ground cover and capture atmospheric carbon.

**Feature Measure:** Each Planted Seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 3,000.00

**Scenario Total Cost:** $34,222.25

**Scenario Cost/Unit:** $11.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 15 | $370.50 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 25 | $463.75 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 15 | $205.05 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 75 | $960.75 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 100 | $3,222.00 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 3000 | $3,690.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 3000 | $16,920.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 3000 | $7,320.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #2 - Low Density Conifer Planting

**Scenario Description:**

This practice involves planting of conifer tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a low density planting rate of between 100 and 200 conifer trees per acre depending on establishment goals and current tree stocking. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490), Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: •Degraded plant condition: inadequate structure and composition •Degraded plant condition: undesirable plant productivity and health •Inadequate habitat for fish and wildlife: habitat degradation •Soil erosion: sheet, rill, and wind erosion •Air quality impacts: emissions of greenhouse gases - GHGs

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowner's objectives. To be a viable forest, additional seedlings need planting. Wildlife habitat is rated poor. Competing vegetation limits the establishment of desirable tree cover. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted).

**After Situation:**

10 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. Post-planting competing vegetation control is planned to ensure seedling survival.

**Feature Measure:** Each Planted Seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $4,930.32

**Scenario Cost/Unit:** $2.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 20 | $494.00 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 16 | $218.72 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 48 | $614.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Small | 1512 | Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.60 | 2000 | $1,200.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #3 - Shrubs Planting

**Scenario Description:**

Shrubs are planted to provide a more diverse habitat. Plantings are in either uplands or bottomlands. The site lacks ground level habitat structure and diversity for widlife. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

Little or no shrubbery vegetation, is present under the forest overstory. Wildlife species that need shrub cover are not present. An adequate stand of overstory trees is present, but it is a single level, not multi-level. Resource concern is inadequate habitat for fish and wildife - habitat fragmentation.

**After Situation:**

A 10 acre area is planted with shrubs. Shrubs are not planted over the entire 10 acres. They are planted in groups or motts. The motts, more or less circular in shape, are 50 feet in diameter, with 50 shrubs planted within each mott. 4 motts are planted per acre for a total of 200 shrubs per acre. Motts are randomly established to take advantage of site conditions and shrub species being planted.

**Feature Measure:** Each Planted shrub

**Scenario Unit:** Each

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $3,260.55

**Scenario Cost/Unit:** $1.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 17 | $217.77 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 17 | $547.74 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.76 | 2000 | $1,520.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows | Each | $0.12 | 2000 | $240.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #4 - Medium Density Hardwood Trees with Shelters

**Scenario Description:**

This practice involves planting of hardwood tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate of between 76 and 200 trees per acre depending on establishment goals and current tree stocking. Newly planted hardwood seedlings are protected from environmental impacts by installing shelters. Trees are planted at 15 foot spacing or greater. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490), Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: •Degraded plant condition: inadequate structure and composition •Degraded plant condition: undesirable plant productivity and health •Inadequate habitat for fish and wildlife: habitat degradation •Soil erosion: sheet, rill, and wind erosion •Air quality impacts: emissions of greenhouse gases - GHGs

**Before Situation:**

The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation limits the establishment of desirable tree cover. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted).

**After Situation:**

Ten acres of land is established with permanent tree and shrub cover. Establishing forest vegetation also creates corridors for wildlife movement. All planted trees are protected from environmental impacts by shelters (solid tree tubes or wire cages). Post-planting competing vegetation control is planned to ensure seedling survival.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $22,552.85

**Scenario Cost/Unit:** $2,255.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 24 | $592.80 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 17 | $232.39 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 50 | $640.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 50 | $1,611.00 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 2000 | $2,460.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 2000 | $11,280.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 2000 | $4,880.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #5 - Low Density, Hardwood Tree/Shrub with Shelters

**Scenario Description:**

This practice involves planting of hardwood tree and shrub seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a low density planting rate density planting rate of between 50 and 100 trees per acre and 25 to 50 shrubs per acre depending on establishment goals and current tree and shrub stocking. Newly planted hardwood seedlings are protected from environmental impacts by installing shelters. Trees and shrubs are planted at 15 foot spacing or greater. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490), Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: •Degraded plant condition: inadequate structure and composition •Degraded plant condition: undesirable plant productivity and health •Inadequate habitat for fish and wildlife: habitat degradation •Soil erosion: sheet, rill, and wind erosion •Air quality impacts: emissions of greenhouse gases - GHGs

**Before Situation:**

The land has a little/no tree/shrub canopy or is stocked with the wrong species. Competing vegetation limits the establishment of desirable tree and shrub cover. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted).

**After Situation:**

Ten acres of land is established with permanent tree and shrub cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. All planted trees and shrubs are protected from environmental impacts by shelters (solid tree tubes or wire cages). Post-planting competing vegetation control is planned to ensure seedling survival.

**Feature Measure:** Acres of area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $17,233.31

**Scenario Cost/Unit:** $1,723.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 32 | $790.40 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 88 | $1,202.96 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 80 | $1,024.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 5 | $267.55 |
| **Materials** | | | | | | |
| Shrub, Seedling, Small | 1506 | Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only. | Each | $0.76 | 500 | $380.00 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 1000 | $1,230.00 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $2.49 | 500 | $1,245.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 1000 | $5,640.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 24 in. | 1580 | 3/4 in. x 3/4 in. x 24 in. wood stakes to fasten items in place. Includes materials only. | Each | $0.87 | 500 | $435.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 1000 | $2,440.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #8 - Medium Density Conifer Planting

**Scenario Description:**

This practice involves planting of conifer tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a high density planting rate of between 201 and 436 trees per acre depending on establishment goals and current tree stocking. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490), Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: •Degraded plant condition: inadequate structure and composition •Degraded plant condition: undesirable plant productivity and health •Inadequate habitat for fish and wildlife: habitat degradation •Soil erosion: sheet, rill, and wind erosion •Air quality impacts: emissions of greenhouse gases - GHGs

**Before Situation:**

The land has a little/no tree cover. Competing vegetation limits the establishment of desirable tree cover. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted).

**After Situation:**

Ten acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. Post-planting competing vegetation control is planned to ensure seedling survival.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $5,131.00

**Scenario Cost/Unit:** $513.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 12 | $164.04 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 12 | $153.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 36 | $1,159.92 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Small | 1512 | Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.60 | 4360 | $2,616.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #9 - Planting, container

**Scenario Description:**

Potted, hardwood seedlings are hand planted to re-establish an upland hardwood forest. Resource setting is an historic upland, hardwood forest. Rapid establishment is necessary to meet the resource concern, ensure survivability, and meet the desired canopy at maturity. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

A cropped, grazed, hay, or bushy forest is re-established to native forest. Existing resource concerns require rapid establishment to ensure a successful stand at maturity. Terrain is gently to moderately sloping. Excessive soil erosion or water quality problems exist. Other concerns include degraded plant condition, undesirable productivity and health, inadequate structure and composition, and inadequate habitat for fish and wildlife. Area is subject to a high risk of survivability due deer pressure, browse and rub, competition, and other environmental factors influencing the survivability.

**After Situation:**

A five acre area is treated with potted, containerized hardwood seedlings. Trees are hand planted at a rate of 120 trees per acre. Trees and shrubs have a 75% survivability rate with an expected rate of 90 trees per acre at maturity. Typical healthy, hardwood forests in the region have around 100 trees at maturity. Post vegetation control is evaluated and conducted as necessary to ensure stand development. Due to the high risk of survivability, container plants are necessary to ensure adequate canopy at maturity.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $9,954.98

**Scenario Cost/Unit:** $1,991.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 16 | $218.72 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 30 | $384.30 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 30 | $966.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 600 | $2,808.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 600 | $3,384.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 36 in. | 1581 | 3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 600 | $942.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #10 - High Density Hardwoods with Shelters

**Scenario Description:**

This practice involves planting of hardwood tree seedlings after the site has been prepared for seedling growth and establishment. Newly planted hardwood seedlings are protected from environmental impacts by installing shelters. The productivity of the site is good and will handle a high density planting rate of between 301 and 436 trees per acre depending on establishment goals and current tree stocking. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490), Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: •Degraded plant condition: inadequate structure and composition •Degraded plant condition: undesirable plant productivity and health •Inadequate habitat for fish and wildlife: habitat degradation •Soil erosion: sheet, rill, and wind erosion •Air quality impacts: emissions of greenhouse gases - GHGs

**Before Situation:**

The land has a little/no tree cover. Competing vegetation limits the establishment of desirable tree cover. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted).

**After Situation:**

Ten acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. All planted trees are protected from environmental impacts by shelters (solid tree tubes or wire cages). Post-planting competing vegetation control is planned to ensure seedling survival.

**Feature Measure:** Area of planting

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $48,171.31

**Scenario Cost/Unit:** $4,817.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 32 | $790.40 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 28 | $382.76 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 109 | $1,396.29 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 109 | $3,511.98 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 28 | $1,498.28 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 4360 | $5,362.80 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 4360 | $24,590.40 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 4360 | $10,638.40 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #11 - High Density Conifer Planting

**Scenario Description:**

Conifer tree seedlings will be hand planted in the forested area where few or no forest trees are growing. Seedlings are planted at a rate of between 437 and 605 trees per acre. The existing stand of trees or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490) Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: •Degraded plant condition: inadequate structure and composition •Degraded plant condition: undesirable plant productivity and health •Inadequate habitat for fish and wildlife: habitat degradation •Soil erosion: sheet, rill, and wind erosion •Air quality impacts: emissions of greenhouse gases - GHGs

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowner's objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 10 acres at a rate of 605 trees per acre, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

**Feature Measure:** Number of trees planted

**Scenario Unit:** Each

**Scenario Typical Size:** 6,050.00

**Scenario Total Cost:** $5,498.56

**Scenario Cost/Unit:** $0.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 8 | $102.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Small | 1512 | Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.60 | 6050 | $3,630.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #46 - Supplemental Hardwood Tree Planting with Shelters

**Scenario Description:**

This practice is applied in forested areas where supplemental hardwood tree planting provides a conservation benefit. The site has been prepared for seedling establishment and growth. The productivity of the site is good and will handle a supplemental density planting rate of between 50 and 75 trees per acre depending on establishment goals and current tree stocking. Newly planted hardwood seedlings are protected from environmental impacts by installing shelters. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490), Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: •Degraded plant condition: inadequate structure and composition •Degraded plant condition: undesirable plant productivity and health •Inadequate habitat for fish and wildlife: habitat degradation •Soil erosion: sheet, rill, and wind erosion •Air quality impacts: emissions of greenhouse gases - GHGs

**Before Situation:**

The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation limits the establishment of desirable tree cover. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted).

**After Situation:**

Ten acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. All planted trees are protected from environmental impacts by shelters (solid tree tubes or wire cages). Post-planting competing vegetation control is planned to ensure seedling survival.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $8,438.02

**Scenario Cost/Unit:** $843.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 16 | $204.96 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 750 | $922.50 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 750 | $4,230.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 750 | $1,830.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #69 - Tree/Shrub Regeneration Area with Protection

**Scenario Description:**

Naturally regenerate a forest stand using properly timed even-aged overstory harvesting methods and necessary site preparation. When implemented with the guidance of a professional forester, such silvicultural activities result in well stocked stands representative of the natural community. Standard forestry measures are used to provide temporary protection for regenerating trees, to improve the likelihood of successful regeneration and achieve landowner objectives for future forest stand composition. Seedlings are protected by temporary 8' high fencing materials or poly netting, designed to be moved when regeneration is established. Clearing of brush and undesirable trees is not necessary. Resource concerns include: Degraded Plant Condition - Inadequate structure and composition, Undesirable plant productivity and health, and/or Inadequate Habitat for Fish and Wildlife - Habitat degradation; and/or Water Quality Degradation - Excessive sediment in surface waters.

**Before Situation:**

Forest stands lack the desired species composition and/or structure, and/or have been impacted by environmental stressors and are unhealthy. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are limiting to natural forest regeneration and establishment, and temporary protection will be needed. Primary resource concerns are Degraded Plant Condition - Inadequate structure and composition and Inadequate Habitat for Fish and Wildlife - Habitat degradation.

**After Situation:**

Natural forest regeneration has been accomplished on 10 acres of forest land. Trees are successfully established and the forest exhibits the planned mix of diverse native tree species. The future forest will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, and sequester carbon.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $11,826.10

**Scenario Cost/Unit:** $1,182.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 20 | $494.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Wire, Woven, Wildlife, 96 in. | 6 | High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only. | Each | $765.16 | 8 | $6,121.28 |
| Post, Wood, CCA treated, 6 in. x 12-14 ft. | 13 | Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only. | Each | $39.56 | 8 | $316.48 |
| Post, Steel T, 1.33 lbs, 10 ft. | 17 | Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only. | Each | $14.19 | 127 | $1,802.13 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.15 | 2704 | $405.60 |
| Property/Safety Signs | 293 | Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only. | Each | $2.02 | 25 | $50.50 |
| Gate, Game, 8 ft. High X 4 ft. Wide | 1082 | 4 Foot wide game gate (8 feet tall). Includes materials and shipping only. | Each | $277.11 | 1 | $277.11 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #85 - Individual Hardwood Container Trees with Shelters

**Scenario Description:**

Hardwood trees will be planted in the forested area where few or no trees are growing. The existing stand of trees needs under-planting, or the previous planted seedling tree stocking level is below desirable conditions. Trees are planted at a rate of 200 trees per acre. Trees are protected from environmental impacts. Containerized stock is used because it can better withstand environmental stressors. Also, tree survival is improved with larger stock, so fewer trees and protective structures are needed. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490), Brush Management (314), Herbaceous Weed Treatment (315) Resource concerns include: •Degraded plant condition: inadequate structure and composition •Degraded plant condition: undesirable plant productivity and health •Inadequate habitat for fish and wildlife: habitat degradation •Soil erosion: sheet, rill, and wind erosion •Air quality impacts: emissions of greenhouse gases – GHGs

**Before Situation:**

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the resource objectives. Wildlife habitat is poor.

**After Situation:**

The prescribed number of trees are planted on 10 acres. All planted trees are protected from impacts by shelters (solid tubes or wire cages). Tree cover will provide wildlife habitat, provide long-term ground cover, and capture atmospheric carbon.

**Feature Measure:** Each Planted Tree

**Scenario Unit:** Each

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $31,626.39

**Scenario Cost/Unit:** $15.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 15 | $370.50 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 24 | $445.20 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 15 | $205.05 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 72 | $922.32 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 96 | $3,093.12 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 2000 | $9,360.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 2000 | $11,280.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 2000 | $4,880.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #90 - High Density planting

**Scenario Description:**

This practice applies to forestlands that are being actively managed. Tree seedlings are planted after the site has been prepared for seedling establishment and growth. Forest site productivity is high or very high and dense planting is planned. Larger containerized seedlings are planted. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain conditions allow for mechanical tree planting

**Before Situation:**

The land lacks forest cover and needs replanting, is stocked with the wrong tree species, or is a nonstocked field. Seedlings selected are appropriate for the site and site conidtions. The main resource concerns are degraded plant condition and inadequate structure and composition. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss organic matter in top soil. Tree seedlings with larger size root systems are planted to compete with other vegetation.

**After Situation:**

50 acres of land is established with permanent tree cover that will improve degraded plant condition, establish wildlife habitat, sequester atmospheric carbon. Establishing forest vegetation also creates corridors for wildlife movement. Actions should be planned with competing vegetation concerns.

**Feature Measure:** area of treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $29,552.46

**Scenario Cost/Unit:** $591.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 34 | $2,498.66 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 14 | $345.80 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 34 | $199.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 37 | $1,258.74 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 14 | $749.14 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.66 | 34000 | $22,440.00 |
| **Mobilization** | | | | | | |
| Mobilization, Material, distance > 50 miles | 1043 | Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price. | Dollars | $1.00 | 100 | $100.00 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #96 - Hardwood Est.-Direct Seeding

**Scenario Description:**

Native seed (acorns, nuts, etc.) from native tree species are broadcast-seeded and lightly tilled into the soil. Native seeds are purchased locally to produce trees known to be adapted to local conditions. Site preparation is completed prior to seeding using CPS 490-Tree/Shrub Site Preparation. Resource concerns are: Plant Structure and Composition; Plant Productivity and Health; Terrestrial Habitat for Wildlife and Invertebrates.

**Before Situation:**

In forested settings, the forest is degrading. Valuable trees are not present, or are not regenerating due to changes in the natural disturbance regime or past harvesting. Undesirable shade-tolerant tree species have regenerated and either dominate the site or compete with desirable species. In openland settings, current vegetative cover is undesirable and does not address resource concerns.

**After Situation:**

Seed from native tree species has been planted at prescribed rates. Plant condition and terrestrial wildlife habitat are improving.

**Feature Measure:** Area of Treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $5,235.54

**Scenario Cost/Unit:** $523.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 4 | $52.84 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 10 | $122.70 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 4 | $108.32 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| **Materials** | | | | | | |
| Trees and shrubs, seed | 1871 | Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only. | Pound | $7.14 | 600 | $4,284.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #101 - Tree-Shrub Establishment - Small Acreage

**Scenario Description:**

Seedling (potted) to be planted for conservation purposes other than reforestation. Planting will be by hand. The resource setting is an area that historically was an upland forest. Resource concerns are degraded plant condition - undesirable productivity and health, and inadequate structure and composition; inadequate habitat for fish and wildlife.

**Before Situation:**

The native forest has been removed and the land is either row cropped, farmstead, or associated agricultural land. If any upland trees exist, they are poor quality or undesirable species. Terrain is gently to moderately sloping with soil erosion-sheet and rill occurring.

**After Situation:**

Typical treatment area can range from less than 1 acre to 5 acres; typical scenario based on 1 ac, 150 TPA. Potted/containerized hardwood seedlings are planted by hand. Post vegetation control should be evaluated and conducted, if necessary.

**Feature Measure:** Planted Seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 150.00

**Scenario Total Cost:** $2,820.69

**Scenario Cost/Unit:** $18.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.09 | 3 | $30.27 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 5 | $64.05 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 35 | $1,127.70 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 75 | $511.50 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 75 | $930.75 |

**Practice:** 614 - Watering Facility

**Scenario** #1 - Frost Proof Trough (2 Ball)

**Scenario Description:**

A 2 ball frost-proof watering facility (also called a frost-free, freeze-free, or freeze-proof watering facility) is installed on a compacted gravel surface (10x10) with underlain geotextile in order to meet the daily requirements of the herd. Due to the available soil conditions, the gravel/geotextile surface is necessary to provide a stable surface for which the watering facility can be placed and will not settle. The 2 ball watering system needs to be permanently mounted on concrete (0.3 Cu.Yd) to prevent overturning by wind and animals. This particular installation typically requires equipment with operator and a skilled laborer to assist in site preparation and connecting the trough to existing pipeline. Associated Practice(s): Access Control (472), Fence (382), Heavy Use Area Protection (561), Livestock Pipeline (516), Prescribed Grazing (528), and Spring Development (574).

**Before Situation:**

A pasture grazed with 50 or more cattle has insufficient water supply that does not provide adequate stock water and inhibits proper animal distribution within the pasture. Animals typically have access to a surface water supply such as a stream or pond causing soil erosion and impacting water quality.

**After Situation:**

A permanent 2-ball, frost proof watering facility is installed on a compacted gravel surface and mounted on cement to provide animal access to an adequate water supply throughout the year. A frost proof trough is needed to provide livestock access to water during colder months. The alternate water supply now provides year-round water to livestock to adequately meet water needs based on the size of the herd and improve animal distribution within the pasture due to proper placement away from the surface water body. Due to an alternate water supply away from the surface water body animal traffic is reduced on streambanks and/or shorelines therefore improving water quality and reducing soil erosion.

**Feature Measure:** Per Unit

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,426.43

**Scenario Cost/Unit:** $1,426.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 0.3 | $162.09 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 11.1 | $15.76 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1.85 | $57.63 |
| Tank, Freeze Proof, 2 hole | 280 | Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping. | Each | $700.58 | 1 | $700.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #2 - Gravity Concrete Trough

**Scenario Description:**

A 500 gallon concrete watering trough is installed at a lower elevation to the water source to allow gravity inflow into the system without the use of electricity. The concrete watering trough is installed on a gravel pad (10x10) with geotextile. Due to the available soil conditions, the gravel/geotextile surface is necessary to provide a stable surface for which the watering facility can be placed and will not settle. A large capacity water supply is needed due to the slow rate of replenishment into the watering facility from the water source. Due to the unlevel surface, the area needs to be shaped with equipment and operator. Additional equipment and labor will be needed to place the concrete trough. Associated Practice(s): Access Control (472), Fence (382), Heavy Use Area Protection (561), Livestock Pipeline (516), Prescribed Grazing (528), and Spring Development (574).

**Before Situation:**

A pasture grazed with 80 dairy cows has insufficient water supply that does not provide adequate stock water and inhibits proper animal distribution within the pasture. Animals typically have access to a surface water supply such as a stream or pond causing soil erosion and impacting water quality. The pasture has no access to a water supply from a well and/or electricity, but there may be a potential supply of water, such as from a spring, which provides a slow rate of flow. The terrain slope is greater than 0.2%. The pasture is grazed throughout the year.

**After Situation:**

A permanent, year round 500 gallon concrete trough is installed on a compacted gravel surface to provide animal access to an adequate water supply throughout the year. A concrete trough is installed on a graded surface due to the unlevel surface to support the trough. Due to the lack of electricity and/or well water supply, the concrete trough is installed at a lower elevation to the water source to allow gravity inflow to the system. The slope of the terrain must be greater than 0.2% to accommodate a gravity inflow system. The slow rate of water flow into the system from the water source, a greater capacity is required. Freezing is not an issue due to the continual flow of water and insulation of the trough. The alternate water supply now provides year-round water to livestock to adequately meet water needs based on the size of the herd and improve animal distribution within the pasture due to proper placement away from the surface water body. Due to an alternate water supply animal traffic is reduced on streambanks and/or shorelines improving water quality and reducing soil erosion.

**Feature Measure:** Per Trough

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,654.86

**Scenario Cost/Unit:** $1,654.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 11.1 | $15.76 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1.85 | $57.63 |
| Tank, Concrete, 500 gallon | 1049 | Concrete tank for water storage, with riser and lid. Includes materials and delivery | Each | $1,091.10 | 1 | $1,091.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #3 - Portable Trough

**Scenario Description:**

A 100 gallon portable watering trough are installed in a pasture in support of a seasonal prescribed grazing system. A float is needed to maintain the water level within the portable trough. Throughout the grazing season, the trough is moved periodically to provide access to the herd as it moves through the paddocks and to prevent the buildup of nutrients in any one location. To ensure an adequate lifespan, the watering trough is removed from the pasture during the winter months and stored in a protected location. Associated Practice(s): Access Control (472), Fence (382), Heavy Use Area Protection (561), Livestock Pipeline (516), Prescribed Grazing (528), and Spring Development (574).

**Before Situation:**

A prescribed pasture system is seasonally grazed by 80 dairy cows and lacks watering facilities at the appropriate locations within the grazing system. Current watering locations inhibit proper animal distribution within the pasture causing the development of bare spots which also receive excessive amounts of manure as the herd congregates in these areas, resulting in water quality concerns.

**After Situation:**

A portable plastic watering trough is installed to provide water to the herd away from hydrologically sensitive areas. Because the trough is portable, it can be moved to reduce the build up of excessive nutrients in one location within the grazing system, thereby reducing the risk of impaired water quality. Placement of the trough is determined by a prescribed grazing plan.

**Feature Measure:** Per Trough

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $276.29

**Scenario Cost/Unit:** $276.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Tank, Polyethylene, 100 gallon | 290 | Portable heavy duty rubber stock tank. | Each | $144.09 | 1 | $144.09 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $99.98 | 1 | $99.98 |

**Practice:** 614 - Watering Facility

**Scenario** #4 - Portable Trough with Hydrant

**Scenario Description:**

A 100 gallon portable watering trough and frost free hydrant are installed to provide a movable water supply to facilitate an extended season grazing plan. The trough is sized to provide a one-day supply of water based on the daily requirements of the herd and replenishment rates. A float is needed to maintain the water level within the portable trough. Additional labor is required to attach the frost free hydrant to the system. A water hose is installed to connect the hydrant to the trough. Due the extended grazing season and freezing overnight weather conditions, a frost free hydrant is required to replenish the system. Throughout the grazing season, the trough is moved periodically to provide access to the herd as it moves through the paddocks and to prevent the buildup of nutrients in any one location. To ensure an adequate lifespan, the watering trough is removed from the pasture during the winter months and stored in a protected location. Associated Practice(s): Access Control (472), Fence (382), Heavy Use Area Protection (561), Livestock Pipeline (516), Prescribed Grazing (528), and Spring Development (574).

**Before Situation:**

A prescribed pasture system is seasonally grazed by 80 dairy cows and lacks watering facilities at the appropriate locations within the grazing system. Current watering locations inhibit proper animal distribution within the pasture causing the development of bare spots which also receive excessive amounts of manure as the herd congregates in these areas, resulting in water quality concerns. The prescribed grazing plan calls for grazing through an extended season.

**After Situation:**

A portable plastic watering trough and frost free hydrant are installed to provide water to the herd away from hydrologically sensitive areas. Because the trough is portable, it can be moved to reduce the build up of excessive nutrients in one location within the grazing system, thereby reducing the risk of impaired water quality. Placement of the trough is determined by a prescribed grazing plan. The frost free hydrant guarantees that water will be available throughout the colder, shoulder months of the extended grazing season.

**Feature Measure:** Per Trough

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $339.99

**Scenario Cost/Unit:** $339.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Freeze Proof Hydrant, <= 3 ft. | 240 | Freeze Proof Hydrant, 3 foot or less bury. Materials only. | Each | $63.70 | 1 | $63.70 |
| Tank, Polyethylene, 100 gallon | 290 | Portable heavy duty rubber stock tank. | Each | $144.09 | 1 | $144.09 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $99.98 | 1 | $99.98 |

**Practice:** 614 - Watering Facility

**Scenario** #5 - Storage Tank

**Scenario Description:**

A 1000 gallon plastic storage tank is installed on a gravel pad (10x10) with geotextile to provide water storage as part of watering facility. A large capacity plastic storage tank is needed because of the extremely slow flow rates from water source or as an emergency supply for several days. Due to the available soil conditions, a gravel/geotextile surface is necessary to provide a stable surface for the tank that will not settle. Due to the unlevel surface, the area needs to be shaped with equipment (with operator). Additional equipment and labor will be needed to place the tank. Associated Practice(s): Access Control (472), Fence (382), Heavy Use Area Protection (561), Livestock Pipeline (516), Prescribed Grazing (528), and Spring Development (574).

**Before Situation:**

A seasonally grazed pasture has insufficient water supply that does not adequately meet the daily water requirements of the herd (consisting of 80 head of cattle) and inhibits proper animal distribution within the pasture. Water is currently supplied by a nearby spring however, the rate of flow is too slow to supply the herd during periods of peak usage. Herd health is impaired as a result.

**After Situation:**

A 1000 gallon enclosed, plastic tank is installed adjacent to the spring to collect and store water which ensures that there is adequate water during times peak usage by the herd. The system is designed as a seasonal water supply for use during the grazing season. Herd health is improved as a result.

**Feature Measure:** Per Tank

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,063.76

**Scenario Cost/Unit:** $2,063.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 11.1 | $15.76 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 1.85 | $57.63 |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.50 | 1000 | $1,500.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #16 - Hydrant with prorated trough cost

**Scenario Description:**

A system is designed with a movable tank used with several hydrants. A water hose is installed to connect the hydrant to the trough. Due the extended grazing season and freezing overnight weather conditions, a frost free hydrant is required to replenish the system. Throughout the grazing season, the trough is moved periodically to these hydrants to provide access to the herd as it moves through the paddocks and to prevent the buildup of nutrients in any one location. To ensure an adequate lifespan, the watering supply to the hydrant is drained and the hydrant is left open to avoid freezing over the winter. Hydrant includes a partial cost of buying a trough when it is shared with several hydrants. No separate trough payment needed. Associated Practice(s): Access Control (472), Fence (382), Heavy Use Area Protection (561), Livestock Pipeline (516), Prescribed Grazing (528), and Spring Development (574)

**Before Situation:**

A prescribed pasture system is seasonally grazed by 80 dairy cows and lacks watering facilities at the appropriate locations within the grazing system. Current watering locations inhibit proper animal distribution within the pasture causing the development of bare spots which also receive excessive amounts of manure as the herd congregates in these areas, resulting in water quality concerns. The prescribed grazing plan calls for grazing through an extended season.

**After Situation:**

Five additional hydrants are associated with one portable trough and installed to provide water to the herd away from hydrologically sensitive areas. Because the trough is portable, it can be moved to each of these hydrants to reduce the build up of excessive nutrients in one location within the grazing system, thereby reducing the risk of impaired water quality. Placement of the trough is determined by a prescribed grazing plan. The frost free hydrant guarantees that water will be available throughout the colder, fall months to extended grazing season.

**Feature Measure:** Number of hydrants

**Scenario Unit:** Each

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $1,079.67

**Scenario Cost/Unit:** $215.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 2 | $19.22 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Freeze Proof Hydrant, <= 3 ft. | 240 | Freeze Proof Hydrant, 3 foot or less bury. Materials only. | Each | $63.70 | 5 | $318.50 |
| Tank, Polyethylene, 100 gallon | 290 | Portable heavy duty rubber stock tank. | Each | $144.09 | 1 | $144.09 |
| Post, Wood, CCA Treated, 4-5 in. X 7 ft. | 1050 | Wood Post, Line 4-5 inch dia. X 7 feet, CCA Treated. Includes materials and shipping only. | Each | $12.78 | 5 | $63.90 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $99.98 | 1 | $99.98 |

**Practice:** 614 - Watering Facility

**Scenario** #51 - Water Ramp, Rock on Geotextile

**Scenario Description:**

A permanent watering facility-water ramp as a means for providing drinking water by storing or providing controlled access for livestock or wildlife constructed of approved materials consisting of rock and or gravel surfacing on geotextile fabric foundation. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility includes all materials, equipment, labor and needed vegatation of disturbed areas to install the surfacing material and will address the resource concerns of inadequate water, soil erosion, water quality degradation and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

**After Situation:**

A permanent watering facility-water ramp as a means for providing drinking water by storing or providing controlled access for livestock or wildlife constructed of approved materials consisting of 640 square feet of rock and or gravel surfacing on 84 square yards of geotextile fabric foundation for livestock or wildlife constructed of approved materials for providing controlled access to drinking water. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility includes all materials, equipment, and labor to install the surfacing material and any needed vegetation for stabilizing disturbed areas. Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Pond (378), or Livestock Pipeline (516) as appropriate. All fencing will use Fence (382).

**Feature Measure:** Area of Ramp

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 640.00

**Scenario Total Cost:** $964.81

**Scenario Cost/Unit:** $1.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 24 | $61.44 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 12 | $10.92 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 12 | $298.56 |
| Geotextile, non-woven, heavy weight | 1210 | Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $1.11 | 84 | $93.24 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 614 - Watering Facility

**Scenario** #52 - Water Ramp, Rock in GeoCell on Geotextile

**Scenario Description:**

A permanent watering facility-water ramp as a means for providing drinking water by storing or providing controlled access for livestock or wildlife constructed of approved materials consisting of rock and or gravel surfacing in cellar containment grid place on geotextile fabric foundation. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility includes all materials, equipment, labor, and needed vegatation of disturbed areas to install the surfacing material and will address the resource concerns of inadequate water, soil erosion, water quality degradation and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

**After Situation:**

A permanent watering facility-water ramp as a means for providing drinking water by storing or providing controlled access for livestock or wildlife constructed of approved materials consisting of 640 square feet of rock and or gravel surfacing in 72 square yards of 4 inch cellar containment grid on 84 square yards of geotextile fabric foundation for livestock or wildlife constructed of approved materials for providing controlled access to drinking water. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility includes all materials, equipment, and labor to install the surfacing material and any needed vegetation for stabilizing disturbed areas. Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Pond (378), or Livestock Pipeline (516) as appropriate. All fencing will use Fence (382).

**Feature Measure:** Area of Ramp

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 640.00

**Scenario Total Cost:** $2,808.37

**Scenario Cost/Unit:** $4.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 24 | $61.44 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 12 | $10.92 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 7 | $225.54 |
| **Materials** | | | | | | |
| GeoCell, 4 inch | 1054 | 4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill | Square Yard | $24.71 | 72 | $1,779.12 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 12 | $298.56 |
| Geotextile, non-woven, heavy weight | 1210 | Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $1.11 | 84 | $93.24 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 614 - Watering Facility

**Scenario** #56 - Above ground poly storage tank <300 gallons

**Scenario Description:**

A permanent watering facility constructed of approved materials having <300 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

A permanent watering facility with water storage capacity of <300 gallons is typically installed to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

**Feature Measure:** number of Tanks

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,086.34

**Scenario Cost/Unit:** $1,086.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |
| Tank, Poly Enclosed Storage, <= 300 gallon | 1073 | Water storage tanks. Includes materials and shipping only. | Gallons | $2.13 | 160 | $340.80 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 13 | $38.87 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #75 - Permanent Drinking or Storage, Capacity less than 500 Gallons

**Scenario Description:**

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with less than 500 gallons of capacity that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

**After Situation:**

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with less than 500 gallons of capacity, installed with all tank materials, tank plumbing and float valve, that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility is placed on a properly prepared foundation with all required materials, plumbing and vegetation for stabilizing disturbed areas. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. All fencing will use Fence (382).

**Feature Measure:** Capacity in Gallons

**Scenario Unit:** Gallons

**Scenario Typical Size:** 250.00

**Scenario Total Cost:** $1,097.88

**Scenario Cost/Unit:** $4.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 0.5 | $1.28 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |
| Tank, Galvanized Steel Livestock, >75 - 300 gallon | 1067 | Includes tank materials and float valve | Gallons | $1.73 | 250 | $432.50 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 0.5 | $12.44 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #76 - Permanent Drinking or Storage Capacity from 500 to 1000 Gallons

**Scenario Description:**

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with 500 to 1,000 gallons of capacity that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

**After Situation:**

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with a capacity of 500 to 1,000 gallons of capacity, installed with all tank materials, tank plumbing and float valve, that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility is placed on a properly prepared foundation with all required materials, plumbing and vegetation for stabilizing disturbed areas. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. All fencing will use Fence (382).

**Feature Measure:** Capacity in Gallons

**Scenario Unit:** Gallons

**Scenario Typical Size:** 750.00

**Scenario Total Cost:** $2,527.60

**Scenario Cost/Unit:** $3.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 2 | $5.12 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 6 | $319.26 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 7 | $225.54 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |
| Tank, Galvanized Steel Livestock, > 300 - 1,000 gallon | 1068 | Includes tank materials and float valve | Gallons | $1.25 | 750 | $937.50 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 2 | $49.76 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #77 - Permanent Drinking or Storage, Capacity greater than 1000 to 5000 Gallons

**Scenario Description:**

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with greater than 1,000 to 5,000 gallons of capacity that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

**After Situation:**

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with a capacity of greater than 1,000 to 5,000 gallons of capacity, installed with all tank materials, tank plumbing and float valve, that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility is placed on a properly prepared foundation with all required materials, plumbing and vegetation for stabilizing disturbed areas. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. All fencing will use Fence (382).

**Feature Measure:** Capacity in Gallons

**Scenario Unit:** Gallons

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $4,855.80

**Scenario Cost/Unit:** $2.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 4 | $1,647.20 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 4 | $10.24 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 9 | $289.98 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 7 | $212.52 |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |
| Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon | 1069 | Includes tank materials, shipping, and float valve, no liner | Gallons | $0.53 | 2000 | $1,060.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #78 - Permanent Drinking or Storage, Capacity greater than 5000 Gallons

**Scenario Description:**

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with greater than 5,000 gallons of capacity that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

**After Situation:**

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with a capacity of greater than 5,000 gallons of capacity, installed with all tank materials, tank plumbing and float valve, that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility is placed on a properly prepared foundation with all required materials, plumbing and vegetation for stabilizing disturbed areas. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. All fencing will use Fence (382).

**Feature Measure:** Capacity in Gallons

**Scenario Unit:** Gallons

**Scenario Typical Size:** 10,000.00

**Scenario Total Cost:** $9,459.76

**Scenario Cost/Unit:** $0.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 7 | $2,882.60 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 13 | $33.28 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 12 | $638.52 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 12 | $296.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 13 | $418.86 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 12 | $408.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 13 | $394.68 |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tank, Galvanized Steel Bottomless Livestock, > 6,000 gallon | 1070 | Includes tank materials, shipping, and float valve, no liner | Gallons | $0.28 | 10000 | $2,800.00 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 0.01 | $1.27 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #79 - Above ground poly storage tank 300 - 1000 gallons

**Scenario Description:**

A permanent watering facility constructed of approved materials having 300 to 1,000 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

A permanent watering facility with water storage capacity of 300 to 1,000 gallons is typically installed to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

**Feature Measure:** Number of tanks

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,583.96

**Scenario Cost/Unit:** $1,583.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.50 | 580 | $870.00 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 13 | $38.87 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #80 - Above ground poly storage tank 1000 - 3000 gallons

**Scenario Description:**

A permanent watering facility constructed of approved materials having 1,000 to 3,000 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

**After Situation:**

to ensure an adequate supply and quality of water for livestock or wildlife. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

**Feature Measure:** Number of tanks

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,713.96

**Scenario Cost/Unit:** $3,713.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.20 | 2500 | $3,000.00 |
| Pipe, PVC, dia. < 18 in., weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only. | Pound | $2.99 | 13 | $38.87 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 614 - Watering Facility

**Scenario** #95 - Tire Trough

**Scenario Description:**

A permanent watering facility for livestock and/or wildlife constructed from tires that stores adequate quantity and quality of water for storage and/or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and/or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

**Before Situation:**

There is insufficient water to meet livestock or wildlife watering needs at a site. Animals may have access to streams or ponds, need to travel a long distance to available water or pasture use and rotation may be affected. This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and/or wildlife where water is not available in sufficient quantities at specific locations; and where habitat, water quality, plant productivity and health needs to be improved. Resource concerns include, but may not be limited to, Plant Condition and Quality, Soil Erosion and Stream Habitat/Water Quality.

**After Situation:**

A permanent watering facility using a 10' diameter tire is installed with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and/or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

**Feature Measure:** Capacity in Gallons

**Scenario Unit:** Gallons

**Scenario Typical Size:** 981.00

**Scenario Total Cost:** $2,840.91

**Scenario Cost/Unit:** $2.90

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 0.7 | $149.69 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 6 | $319.26 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 13 | $418.86 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 7 | $238.14 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Freeze Proof Hydrant, <= 3 ft. | 240 | Freeze Proof Hydrant, 3 foot or less bury. Materials only. | Each | $63.70 | 1 | $63.70 |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |
| Tank, Tire, 10' diameter | 287 | Tire, includes material cost for tank and shipping. Labor and other appurtenance costs not included. | Each | $1,191.25 | 1 | $1,191.25 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 24 | $57.36 |
| Post, Wood, CCA Treated, 4-5 in. X 7 ft. | 1050 | Wood Post, Line 4-5 inch dia. X 7 feet, CCA Treated. Includes materials and shipping only. | Each | $12.78 | 2 | $25.56 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $99.98 | 1 | $99.98 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 1.7 | $42.30 |

**Practice:** 620 - Underground Outlet

**Scenario** #1 - UO 6 inch or less

**Scenario Description:**

Installed 500 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated 52" deep and 24" wide by hydraulic track excavator. Costs include 6" SDR-35 pipe, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $5,181.34

**Scenario Cost/Unit:** $10.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 170 | $481.10 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 170 | $273.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $7.06 | 500 | $3,530.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #2 - UO 6 inch w Riser or less

**Scenario Description:**

Installed 500 feet of 6" approved plastic pipe with Riser Inlet to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54"" deep and 15" wide by trencher. Costs include 6" PVC, 8" PVC perforated riser , trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)In

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $5,369.55

**Scenario Cost/Unit:** $10.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 210 | $594.30 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $7.06 | 500 | $3,530.00 |
| Inlet, riser, 8 in. | 1262 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8 inch diameter. Materials only. | Each | $144.82 | 2 | $289.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #3 - UO 8 to 12 inch

**Scenario Description:**

Install 500 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe ( pipe similar in cost to 8" SDR 35), trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet.This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $5,693.91

**Scenario Cost/Unit:** $11.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 210 | $594.30 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 210 | $338.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 10 in. | 1243 | Pipe, Corrugated HDPE Double Wall, 10 inch diameter with soil tight joints - AASHTO M252. Material cost only. | Feet | $7.28 | 500 | $3,640.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #4 - UO 8 to 12 inch w Riser

**Scenario Description:**

Installed 500 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 8" PVC pipe, 12" Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $6,673.44

**Scenario Cost/Unit:** $13.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 420 | $1,188.60 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 9 | $289.98 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 10 in. | 1243 | Pipe, Corrugated HDPE Double Wall, 10 inch diameter with soil tight joints - AASHTO M252. Material cost only. | Feet | $7.28 | 500 | $3,640.00 |
| Inlet, riser, 12 in. | 1264 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 12 inch diameter. Materials only. | Each | $685.55 | 1 | $685.55 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #5 - UO 15 to 18 inch

**Scenario Description:**

Installed 500 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 66" deep x 39" wide. Costs include 18" HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606), Structure for Water Control (587)

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $13,673.69

**Scenario Cost/Unit:** $27.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 330 | $933.90 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 330 | $531.30 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 60 | $1,869.00 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 18 in. | 1245 | Pipe, Corrugated HDPE Double Wall, 18 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $18.65 | 500 | $9,325.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #6 - UO 21 to 24 inch

**Scenario Description:**

Installed 500 feet of 24" approved plastic pipe to convey stormwate from one location to a suitable outlet. Trench excavation is 78" deep x 56" wide. Costs include 24" HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practices is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606), Structure for Water Control (587)

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

**Feature Measure:** Length of conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $21,618.04

**Scenario Cost/Unit:** $43.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 445 | $1,259.35 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 445 | $716.45 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 85 | $2,647.75 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in. | 1246 | Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $31.96 | 500 | $15,980.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #7 - UO 27 to 30 inch

**Scenario Description:**

Install 500 feet of 30" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 78" deep x 56" wide. Costs include 30" HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practices is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606), Structure for Water Control (587)

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $29,173.84

**Scenario Cost/Unit:** $58.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 565 | $1,598.95 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 565 | $909.65 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 105 | $3,270.75 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 30 in. | 1247 | Pipe, Corrugated HDPE Double Wall, 30 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $44.76 | 500 | $22,380.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #8 - UO over 30 inch

**Scenario Description:**

Install 500 feet of 36" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 84" deep x 64" wide. Costs include 36" HDPE pipe, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606), Structure for Water Control (587).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $37,182.22

**Scenario Cost/Unit:** $74.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 690 | $1,952.70 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 690 | $1,110.90 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 135 | $4,205.25 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 36 in. | 1248 | Pipe, Corrugated HDPE Double Wall, 36 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $57.54 | 500 | $28,770.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #9 - UO with Boring, all sizes

**Scenario Description:**

Installed 500 feet of 8" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. 400' of Trench is excavated 52" deep and 24" wide by hydraulic track excavator. Costs include 8" SDR-35 pipe, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. The other 100' section is bored under road or stream using seamless pipe that meets or exceeds main undergound outlet size and pressure rating. Site location does not allow for open trench. (I.e., No permit can be obtained for open trench on road crossing and/or digging open trench across stream) Applies to all pipe sizes. Appurtenances include: couplings and fittings to connect to planned pipeline and are included in the cost of pipe material (additional 10% of pipe material quantity). The scenario unit is linear feet of bored pipe from coupler to coupler. This practices is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606), Structure for Water Control (587)

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste.

**Feature Measure:** Length of conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $24,627.32

**Scenario Cost/Unit:** $49.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| Horizontal Boring, Greater Than 3 in. diameter | 1132 | Includes equipment, labor and setup. | Feet | $126.18 | 100 | $12,618.00 |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 134 | $379.22 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 134 | $215.74 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, PVC, 8 in., SDR 26 | 991 | Materials: - 8 inch - PVC - SDR 26 160 psi - ASTM D2241 | Feet | $16.61 | 550 | $9,135.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |

**Practice:** 620 - Underground Outlet

**Scenario** #64 - Blind Inlet

**Scenario Description:**

This practice is used to provide an outlet for drainage water from a surface or subsurface drainage system. Install an excavated earthen box with perforated collector tubing placed in the bottom and filled to the surface with bedding material and rock riprap to direct surface flow into a "main line" or subsurface drain. Typically installed at the upper end of a waterway to protect the vegetation of the waterway from prolonged surface flow, thus facilitating vegetative growth and controlling ephemeral gully erosion. Costs include the collection pipe, excavation, and rock. This practice is often installed in conjunction with waterways or similar practices. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), Subsurface Drainage (606), Saturated Buffer (604) and Drainage Water Management (554).

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Excessive water in field indicated by consistent flooding and ponding with wet conditions in turn resulting in degraded and undesirable plant conditions and health.

**After Situation:**

Excessive sedimentation, soil erosion and flooding is controlled through the installation of the blind inlet. The blind inlet will provide adequate outlet for drinage water, protect surface water quality, protect and enhance plant conditions and health and control erosion caused by surface runoff across open fields and steep terrain.

**Feature Measure:** Volume of Fill Material

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 45.00

**Scenario Total Cost:** $3,175.56

**Scenario Cost/Unit:** $70.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 45 | $127.35 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 45 | $72.45 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 15 | $455.40 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 30 | $934.50 |
| Pipe, PVC, 4 in., SDR 41 | 983 | Materials: - 4 inch - PVC - SDR 41 100 psi - ASTM D2241 | Feet | $3.27 | 80 | $261.60 |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 78 | $164.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 620 - Underground Outlet

**Scenario** #100 - 6 inch or less pipe

**Scenario Description:**

Install 500 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated 52" deep and 24" wide by hydraulic track excavator. Costs include 6" SDR-35 pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $6,278.54

**Scenario Cost/Unit:** $12.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 170 | $481.10 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 170 | $273.70 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $7.06 | 500 | $3,530.00 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #101 - 6 inch or less, Riser

**Scenario Description:**

Install 500 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54"" deep and 15" wide by trencher. Costs include 6" HDPE corrugated single wall plastic tubing, 8" Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $3,183.18

**Scenario Cost/Unit:** $6.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 105 | $297.15 |
| Trencher, wheel type | 1259 | Wheel type Trencher, typically 350 HP with 6 foot max depth. Equipment only. | Hours | $163.80 | 5 | $819.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, HDPE, 6 in., CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6 inch diameter - ASTM F405. Material cost only. | Feet | $1.69 | 500 | $845.00 |
| Inlet, riser, 8 in. | 1262 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8 inch diameter. Materials only. | Each | $144.82 | 2 | $289.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #102 - 12 inch or less

**Scenario Description:**

Install 500 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $6,673.16

**Scenario Cost/Unit:** $13.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 210 | $594.30 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 210 | $338.10 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 10 in. | 1243 | Pipe, Corrugated HDPE Double Wall, 10 inch diameter with soil tight joints - AASHTO M252. Material cost only. | Feet | $7.28 | 500 | $3,640.00 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #103 - 12 inch or less, riser

**Scenario Description:**

Install 500 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, 12" Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $6,519.79

**Scenario Cost/Unit:** $13.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 210 | $594.30 |
| Trencher, wheel type | 1259 | Wheel type Trencher, typically 350 HP with 6 foot max depth. Equipment only. | Hours | $163.80 | 5 | $819.00 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 10 in. | 1243 | Pipe, Corrugated HDPE Double Wall, 10 inch diameter with soil tight joints - AASHTO M252. Material cost only. | Feet | $7.28 | 500 | $3,640.00 |
| Inlet, riser, 10 in. | 1263 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 10 inch diameter. Materials only. | Each | $213.54 | 2 | $427.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #104 - 18 inch or less

**Scenario Description:**

Install 500 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 66" deep x 39" wide. Costs include 18" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often is installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $14,759.96

**Scenario Cost/Unit:** $29.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 330 | $933.90 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 330 | $531.30 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 60 | $1,869.00 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 18 in. | 1245 | Pipe, Corrugated HDPE Double Wall, 18 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $18.65 | 500 | $9,325.00 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #105 - 24 inch or less

**Scenario Description:**

Install 500 feet of 24" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 72" x 48" wide. Costs include 24" HDPE pipe, Precast concrete drop inlet with steel grate, 24" HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $22,704.31

**Scenario Cost/Unit:** $45.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 445 | $1,259.35 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 445 | $716.45 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 85 | $2,647.75 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in. | 1246 | Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $31.96 | 500 | $15,980.00 |
| Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft. | 1257 | Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor. | Each | $1,231.45 | 1 | $1,231.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #106 - 30 inch or less

**Scenario Description:**

Install 500 feet of 30" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 78" deep x 56" wide. Costs include 30" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practices is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $30,972.85

**Scenario Cost/Unit:** $61.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 565 | $1,598.95 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 565 | $909.65 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 105 | $3,270.75 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 30 in. | 1247 | Pipe, Corrugated HDPE Double Wall, 30 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $44.76 | 500 | $22,380.00 |
| Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft. | 1258 | Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor. | Each | $1,944.19 | 1 | $1,944.19 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 620 - Underground Outlet

**Scenario** #107 - Greater than 30 inch

**Scenario Description:**

Install 500 feet of 36" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 84" deep x 64" wide. Costs include 36" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

**Before Situation:**

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

**After Situation:**

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

**Feature Measure:** Length of Conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $38,852.35

**Scenario Cost/Unit:** $77.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 690 | $1,952.70 |
| Excavation, common earth, side cast, large equipment | 1227 | Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $1.61 | 690 | $1,110.90 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 2 | $5.56 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement. | Cubic Yards | $146.77 | 1 | $146.77 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 135 | $4,205.25 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 36 in. | 1248 | Pipe, Corrugated HDPE Double Wall, 36 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $57.54 | 500 | $28,770.00 |
| Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft. | 1258 | Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor. | Each | $1,944.19 | 1 | $1,944.19 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 629 - Waste Treatment

**Scenario** #1 - Litter Pasteurization

**Scenario Description:**

This practice scenario includes the in house windrowing of poultry litter to promote pasteurization between flocks. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient and pathogens) and air quality impacts (PM & PM precursors, and objectionable odors). Associated practices: Amendments for Treatment of Agricultural Waste (591), Waste Storage Facility (313), & Nutrient Management (590)

**Before Situation:**

A poultry operation typically removes part of the litter and bedding between flocks, called a cakeout. A full cleanout of litter and bedding is typically done once every 1-3 years depending on the operation. Over time, the accumulation of poultry waste in the litter contributes to an increase in odors and high ammonia emissions in the house contribute to impacts on bird health.

**After Situation:**

This scenario assumes 4 flocks per year in an operation with 2 - 42 x 500 square foot houses. Three (3) in-house pasteurization events will be performed annually. There will be a full cleanout after the 4th flock. Formula to calculate the total number of pasteurization events per year on a 1000 SF basis: (Square Feet of house) / 1000 SF X (Number of houses) X (Number of pasteurization events) = Number of 1000SF. 21,000 SF / 1000 SF X 2 houses X 3 events = 126 units of 1000SF In house pasteurization of poultry litter is achieved by windrowing the litter in the house. The process takes approximately one week. This process successfully addresses the air quality impacts (ammonia emissions, PM and PM precursors) and bird health resource concerns. This process also improves the quality of poultry litter that must be spread on farmland. Bird health is improved and bird mortality is reduced.

**Feature Measure:** Surface Area of housing floor windr

**Scenario Unit:** 1,000 Square Foot

**Scenario Typical Size:** 126.00

**Scenario Total Cost:** $6,855.30

**Scenario Cost/Unit:** $54.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 66 | $4,179.78 |
| Aerator Attachment, 8 in., PTO | 1707 | Aerator attachment for mounting to tractor and PTO, 8 inch diameter. Equipment cost only with out tractor. Brown Bear R24C-8' or equivalent | Hours | $14.34 | 30 | $430.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 66 | $2,245.32 |

**Practice:** 629 - Waste Treatment

**Scenario** #2 - Milking Parlor Waste Treatment System with Dosing System and Bed

**Scenario Description:**

This practice scenario includes a dosed treatment system with bark bed for milking parlor wastewater. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens). Associated practices: Nutrient Management (590), Pumping Plant (533), Fence (382), & Waste Storage Facility (313)

**Before Situation:**

Milkhouse waste water currently outlets in an untreated manner which presents potential soil, water and air quality concerns.

**After Situation:**

This scenario assumes that the treatment system is designed for 500 gal/day of wastewater from the milking parlor. It assumes a two tank scenario. The grease trap acts as the primary settling basin. The wastewater overflows into the septic tank, which is then dosed to the treatment bed (bark bed or leaching gallery). It is assumed that the treatment bed is dosed at 0.16 gal/square ft (3125 sq ft). To maintain bark bed performance, additional bark may need to be added every 3 to 5 years as an O&M task. This practice scenario reduces nutrient content, organic strength, or pathogen levels of agricultural waste; improve air quality by reducing odors and gaseous emissions (methane or ammonia).

**Feature Measure:** Design Flow

**Scenario Unit:** Gallons per Day

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $38,149.53

**Scenario Cost/Unit:** $76.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 118 | $756.38 |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 450 | $688.50 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor to transport and place. | Cubic Yards | $56.47 | 350 | $19,764.50 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 116 | $105.56 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 254 | $977.90 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| **Materials** | | | | | | |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 290 | $652.50 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 10 | $66.30 |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $11.70 | 200 | $2,340.00 |
| Pipe, PE, 2 in., DR 9 | 1000 | Materials: - 2 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $3.37 | 250 | $842.50 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 119 | $2,960.72 |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 382 | $806.02 |
| Prefabricated concrete septic tank, 1500 gal | 1738 | Precast concrete septic tank, 1,500 gal. Materials only. | Each | $1,715.85 | 2 | $3,431.70 |
| Dosing System, siphon | 1763 | Dosing system siphon with typical 3 inch diameter and 12 inch drawdown. Includes materials and shipping only. | Each | $275.54 | 1 | $275.54 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 4 | $676.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 4 | $1,920.52 |

**Practice:** 629 - Waste Treatment

**Scenario** #3 - Milking Parlor Waste Treatment System with Dosing System

**Scenario Description:**

This practice scenario includes a dosed treatment system for milking parlor wastewater that will outlet to a constructed wetland and/or vegetated treatment area and/or other acceptable treatment. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens). Associated practices: Constructed Wetland (656), Vegetated Treatment Area (635), Waste Transfer (634), Nutrient Management (590), Pumping Plant (533), Fence (382), & Waste Storage Facility (313)

**Before Situation:**

Milkhouse waste water currently outlets in an untreated manner which presents potential soil, water and air quality concerns.

**After Situation:**

This scenario assumes that the treatment system is designed for 500 gal/day of wastewater from the milking parlor. It assumes a two tank scenario. The grease trap acts as the primary settling basin. The wastewater overflows into the septic tank, which is then dosed to a treatment area (constructed wetland and/or vegetated treatment area and/or other acceptable treatment). This practice scenario reduces nutrient content, organic strength, or pathogen levels of agricultural waste; improve air quality by reducing odors and gaseous emissions (methane or ammonia).

**Feature Measure:** Design Flow

**Scenario Unit:** Gallons per Day

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $12,603.41

**Scenario Cost/Unit:** $25.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 118 | $756.38 |
| Trenching, Earth, 12 in. x 48 in. | 53 | Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $1.53 | 450 | $688.50 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 138 | $531.30 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $11.70 | 200 | $2,340.00 |
| Pipe, PE, 2 in., DR 9 | 1000 | Materials: - 2 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $3.37 | 250 | $842.50 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 3 | $74.64 |
| Prefabricated concrete septic tank, 1500 gal | 1738 | Precast concrete septic tank, 1,500 gal. Materials only. | Each | $1,715.85 | 2 | $3,431.70 |
| Dosing System, siphon | 1763 | Dosing system siphon with typical 3 inch diameter and 12 inch drawdown. Includes materials and shipping only. | Each | $275.54 | 1 | $275.54 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 4 | $676.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 4 | $1,920.52 |

**Practice:** 629 - Waste Treatment

**Scenario** #4 - Aerator less than or equal to 5 hp

**Scenario Description:**

This practice scenario includes installation of an aerator into a liquid storage pond or tank that has a surface area less than 1 acre. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient and pathogens) and air quality impacts (PM & PM precursors, and objectionable odors). Associated practices: Nutrient Management (590) and Waste Storage Facility (313)

**Before Situation:**

A dairy, swine, or other agricultural operation in which the waste goes into a storage pond. The pond is not managed as an anaerobic lagoon and the nutrients stratify over time and odors are objectionable. It is difficult to properly estimate the nutrient content being pumped onto the land because of the stratification. There is also not enough aerobic microbial activity in the pond to prevent objectionable odors.

**After Situation:**

This scenario assumes that the producer would like to increase oxygen content in the storage pond and mix the waste for even nutrient distribution. Under aerobic conditions microorganisms can convert nutrients and odors will be reduced. Nutrient content of the liquid waste is more uniform which is better for uniform agronomic application rates improving nutrient management and to protect air and water quality resources.

**Feature Measure:** Horse Power of aerator

**Scenario Unit:** Horsepower

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,582.35

**Scenario Cost/Unit:** $1,582.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| **Materials** | | | | | | |
| Aerator, pond, 1 hp | 1708 | 1 hp Aerator for pond or tank with less than 10 acres of surface area. Materials only. | Each | $1,480.03 | 1 | $1,480.03 |

**Practice:** 629 - Waste Treatment

**Scenario** #5 - Aerator greater than 5 hp

**Scenario Description:**

This practice scenario includes installation of an aerator into a liquid storage pond or tank with a surface area larger than 1 acre. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient and pathogens) and air quality impacts (PM & PM precursors, and objectionable odors). Associated practices: Nutrient Management (590) and Waste Storage Facility (313)

**Before Situation:**

A dairy, swine, or other agricultural operation in which the waste goes into a storage pond. The pond is not managed as an anaerobic lagoon and the nutrients stratify over time and odors are objectionable. It is difficult to properly estimate the nutrient content being pumped onto the land because of the stratification. There is also not enough aerobic microbial activity in the pond to prevent objectionable odors.

**After Situation:**

This scenario assumes that the producer would like to increase oxygen content in the storage pond and mix the waste for even nutrient distribution. Under aerobic conditions microorganisms can convert nutrients and odors will be reduced. Nutrient content of the liquid waste is more uniform which is better for uniform agronomic applications rates improving nutrient management and to protect air and water quality resources.

**Feature Measure:** Horse Power of aerator

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $13,082.12

**Scenario Cost/Unit:** $13,082.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| **Materials** | | | | | | |
| Aerator or Circulator, Pond, Large | 1709 | Aerator or Circulator for pond or tank, 10 or more HP and/or 10 or more acres of surface area. Materials only | Each | $12,928.64 | 1 | $12,928.64 |

**Practice:** 629 - Waste Treatment

**Scenario** #6 - Straw Pond Cover

**Scenario Description:**

This practice scenario is a permeable organic cover applied to the liquid surface of a waste storage facility that has a surface area less than or equal to 2 acres. Straw cover applications can remain on top of the pond for between 2 and 6 months. The cover will reduce radiation and wind velocity over the surface of a manure storage to reduce transmission of odors and act as a medium for growth of microorganisms that utilize carbon, nitrogen, and sulfur to decompose odorous compounds. Associated practices include Waste Storage Facility (313).

**Before Situation:**

This practice is applicable on a dairy or swine operation in which the waste goes into a liquid storage pond or tank and the bio-treatment of emissions will improve air quality. The maximum recommended surface area is 2 acres.

**After Situation:**

Permeable organic cover applied to the liquid surface of a waste storage or treatment facility. Organic materials often used as covers include straws, cornstalks and peat moss. Typical application is an 8" straw application on a 120' diameter storage tank every 3 months. The scenario unit calculation is (Surface Area of Pond)*(Number of applications per year). For this scenario, the calculation is: (120/2)^2*pi *4 =45,239sf Organic covers can reduce odors up to 90 percent if the straw cover is 12" deep.

**Feature Measure:** Surface Area of Pond or Tank per a

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 45,239.00

**Scenario Total Cost:** $30,282.96

**Scenario Cost/Unit:** $0.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Brush Chipper, 6 in. capacity | 938 | Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hours | $32.57 | 40 | $1,302.80 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 16 | $1,013.28 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $107.37 | 242.8 | $26,069.44 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 8 | $1,353.12 |

**Practice:** 629 - Waste Treatment

**Scenario** #33 - Poultry Litter Incinerator, 1.7mBTU

**Scenario Description:**

This scenario consists of installing a manufactured poultry litter incinerator that can process up to 500lbs of biomass per hour. Typical scenario consists of two broiler houses each 42'x600'. Furnace sized to handle 1.7 million BTUs. System includes loading conveyor and walking floor or equal, ash collection and removal system with storage, and emissions treatment system that meets state requirements or includes a multicyclone system, dual burner, or air infiltration or equal. System includes control panel with interface.

**Before Situation:**

Litter is not being utilized or controlled in an environmentally safe manner. The waste is either accumulating at the source or other location, or is being transported but not properly utilized/disposed. The situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to excessive amounts of nutrients being applied as fertilizer.

**After Situation:**

Incineration is completed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens from being transported into surface or ground water resources. proper operation of the facility results in little to no odor, reduction in waste volume, and protection from animals functioning as vectors to minimize pathogen survival or spreading effects. Ash materials are to be stored in suitable containers/storages until land disposal as per the nutrient management plan or land-filled.

**Feature Measure:** Number of incinerator systems

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $406,411.48

**Scenario Cost/Unit:** $406,411.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Litter Incinerator, Fixed Cost Portion | 2808 | Litter incinerator system, fixed cost portion. Includes furnace and air filtration. Materials and shipping only. | Each | $335,187.56 | 1 | $335,187.56 |
| Litter Incinerator, Variable Cost Portion | 2809 | Litter incinerator system, variable cost portion. Includes furnace and air filtration. Materials and shipping only. | 1,000 BTU | $37.40 | 1700 | $63,580.00 |

**Practice:** 629 - Waste Treatment

**Scenario** #34 - Poultry Litter Incinerator, 3.8 mBTU

**Scenario Description:**

This scenario consists of installing a manufactured poultry litter incinerator that can process more than 500lbs of biomass per hour. Typical scenario consists of five broiler houses each 42'x600'. Furnace sized to handle 3.8 million BTUs. System includes loading conveyor and walking floor or equal, ash collection and removal system with storage, and emissions treatment system that meets state requirements or includes a multicyclone system, dual burner, or air infiltration or equal. System includes control panel with interface.

**Before Situation:**

Litter is not being utilized or controlled in an environmentally safe manner. The waste is either accumulating at the source or other location, or is being transported but not properly utilized/disposed. The situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to excessive amounts of nutrients being applied as fertilizer.

**After Situation:**

Incineration is completed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens from being transported into surface or ground water resources. proper operation of the facility results in little to no odor, reduction in waste volume, and protection from animals functioning as vectors to minimize pathogen survival or spreading effects. Ash materials are to be stored in suitable containers/storages until land disposal as per the nutrient management plan or land-filled.

**Feature Measure:** Incinerator systems

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $484,951.48

**Scenario Cost/Unit:** $484,951.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Litter Incinerator, Fixed Cost Portion | 2808 | Litter incinerator system, fixed cost portion. Includes furnace and air filtration. Materials and shipping only. | Each | $335,187.56 | 1 | $335,187.56 |
| Litter Incinerator, Variable Cost Portion | 2809 | Litter incinerator system, variable cost portion. Includes furnace and air filtration. Materials and shipping only. | 1,000 BTU | $37.40 | 3800 | $142,120.00 |

**Practice:** 632 - Waste Separation Facility

**Scenario** #1 - Mechanical Separation Facility, 150 AU or less

**Scenario Description:**

A small mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens , vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D),Roofs and Covers (367)and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

One small mechanical separation facility (a screw press) installed at livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system.

**Feature Measure:** Item

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $58,366.61

**Scenario Cost/Unit:** $58,366.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 10 | $4,118.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| **Materials** | | | | | | |
| Vibratory or Rotating Screen | 1948 | Vibratory or Rotating Screen, includes materials, shipping and equipment. | Each | $51,349.47 | 1 | $51,349.47 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 3 | $208.32 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 632 - Waste Separation Facility

**Scenario** #2 - Mechanical Separation Facility, Large, over 150 AU

**Scenario Description:**

A large mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens , vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), Roofs and Covers (367) and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

A large mechanical separation facility (a screw press) installed at livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system.

**Feature Measure:** Item

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $57,477.91

**Scenario Cost/Unit:** $57,477.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 12 | $4,941.60 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| **Materials** | | | | | | |
| Screw or Roller Press - Small | 1950 | Screw or Roller Press with a capacity of < 100 GPM. Includes materials and equipment. | Each | $49,637.17 | 1 | $49,637.17 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 3 | $208.32 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 632 - Waste Separation Facility

**Scenario** #3 - Earthen Settling Structure

**Scenario Description:**

An earthen structure, such as a basin or a terrace or dike like structure, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. A concrete pad should be installed on the bottom of the basin and around outlet structures to facilitate cleanout. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

One earthen settling basin structure (60 ft wide by 200 ft long by 3 ft deep, with three screening outlet structures) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

**Feature Measure:** Cubic Foot of Design Storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 30,000.00

**Scenario Total Cost:** $16,150.38

**Scenario Cost/Unit:** $0.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 12 | $6,483.60 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 1000 | $2,560.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1000 | $4,210.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 14 | $436.10 |
| Weeping Wall | 1765 | Weeping wall or picket screen structure for solid settling basin. Materials only. | Feet | $38.53 | 24 | $924.72 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 3 | $208.32 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 632 - Waste Separation Facility

**Scenario** #4 - Concrete Basin

**Scenario Description:**

A concrete structure, such as a basin with concrete walls and floor, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

One concrete settling basin structure (20 ft wide by 30 ft long with 3 ft high walls and weeping wall/picket structure or outlet control) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

**Feature Measure:** Cubic Foot of Design Storage

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 1,800.00

**Scenario Total Cost:** $14,598.64

**Scenario Cost/Unit:** $8.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 12 | $4,941.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 12 | $6,483.60 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 50 | $71.00 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 50 | $128.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 50 | $210.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 32 | $996.80 |
| Weeping Wall | 1765 | Weeping wall or picket screen structure for solid settling basin. Materials only. | Feet | $38.53 | 6 | $231.18 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 3 | $208.32 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 632 - Waste Separation Facility

**Scenario** #5 - Concrete Sand Settling Lane

**Scenario Description:**

A concrete structure, a concrete lane with curbs, used to capture and separate a portion of the solids, mainly sand, from a liquid stream from a confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), Roofs and Covers (367) and Waste Treatment (629).

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

One concrete settling lane structure (25 ft wide by 200 ft long by 0.5 ft thick) constructed around or at a livestock feeding operation. Removes a portion of the solids (sand) that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

**Feature Measure:** Square Foot of Settling Lane Footpr

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 5,000.00

**Scenario Total Cost:** $52,789.40

**Scenario Cost/Unit:** $10.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 90 | $37,062.00 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 20 | $10,806.00 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 180 | $460.80 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 90 | $378.90 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 90 | $2,803.50 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 3 | $208.32 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 632 - Waste Separation Facility

**Scenario** #6 - On lot solid separation screen and riser box

**Scenario Description:**

An on lot screen is installed to separate solid and liquid wastes from an animal waste stream on an animal confinement area, such as a heavy use area. Separating the waste and containing the waste stream allows for protection of air and water quality, protects animal health, and improves the management of an animal waste management system. The separated liquid waste is pumped into a collection basin to be ultimately treated through a vegetated treatment area or flows to a waste storage facility or treatment pond. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Heavy Use Area Protection (561), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Roofs and Covers (367) and Waste Treatment (629)

**Before Situation:**

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

**After Situation:**

A 2' high concrete wall surrounds a double screen that protects the outflow pipe from solids. Screens 6' long by 2' high. Concrete box area is 24 SF. with one side open for screens. Liquids now can flow off lot without plugging discharge pipe prior to going to storage or treatment as part of an animal management system.

**Feature Measure:** Square foot of box area

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 24.00

**Scenario Total Cost:** $1,586.55

**Scenario Cost/Unit:** $66.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1 | $411.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1 | $540.30 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 5 | $12.80 |
| Excavation, common earth, large equipment, 50 ft | 1222 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $1.63 | 11 | $17.93 |
| Compaction, earthfill, vibratory plate | 1260 | Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor. | Cubic Yards | $2.78 | 30 | $83.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 0.5 | $15.58 |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $7.06 | 4 | $28.24 |
| Wire Mesh Screen, galvanized, 1/16 in | 1229 | Wire Mesh Screen, galvanized, 1/16 inch grid spacing. Materials only. | Square Feet | $4.28 | 24 | $102.72 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 633 - Waste Recycling

**Scenario** #1 - Export Ag Waste By-products Recycled for Use Off Farm

**Scenario Description:**

Agricultural by-products on the farm are in excess of the ability of the farm and limited crop landbase to utilize. These waste materials are accumulating in such a manner that the water, soil and/or air quality have resource concerns. The application of a waste management plan will recycle these by-products such that the quality of the natural resources will be improved and the environment protected. The agricultural by-products are tested and exported off the farm operation for external uses. Records are kept detailing disposition of the waste, including date, amount, and receiver of the waste. Results of the agricultural by-product laboratory analysis is also provided to the receiver. Associated practices: 313-Waste Storage Facility, 317-Composting Facility, 590-Nutrient Management

**Before Situation:**

Agricultural by-products are produced or accumulated on the farm in amounts that cannot be utilized by the farm without causing resource concerns such as degradation of water quality, soil health and/or air quality.

**After Situation:**

Twice a year the excess agricultural by-products that have been collected at the farm are sampled and laboratory tested to determine the characteristics of the waste material that is recycled. The results of this analysis will determine the basis of its use. The agricultural by-products are then handled according to the waste management system plan. The intended off-farm use of the recycled agricultural waste by-products will refer to the laboratory analysis. Records shall be kept of the analysis, dates and quantities of recycled waste exported.

**Feature Measure:** Farm

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $571.08

**Scenario Cost/Unit:** $571.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 2 | $92.48 |

**Practice:** 633 - Waste Recycling

**Scenario** #2 - Utilization of Non-Ag Waste By-products

**Scenario Description:**

A farm with soil quality resource concerns utilizes non-agricultural, by-product composted material to improve soil quality. The farm is located near a facility that processes and/or produces non-agricultural waste such as food processing waste or municipal green waste recycling center. The product is land applied within 7 days of receipt and spread less than 6 inches thick. The material is mixed into the top layer of soil using tillage operations that are in addition to normal tillage operations used for seedbed preparation. This is necessary to allow the organic carbon to be assimilated into the top layer of soil and prevent off-site movement. Records are kept to document the methods and utilization of the non-agricultural products for agricultural purposes. Material is tested once before application. Associated practices: 313-Waste Storage Facility, 317-Composting Facility, 590-Nutrient Management

**Before Situation:**

A farm with degraded soil quality and low organic matter is located near a municipal green waste recycling or food processing center. The waste material from the facility is not being utilized and is disposed of. The farm has the ability to receive additional material from off-site as per a nutrient management plan.

**After Situation:**

Incorporation of non-agricultural, organic waste as per a nutrient management plan improves soil organic matter and overall soil quality. Non-agricultural waste is delivered to the farm and incorporated and tilled into the soil within 7 days of receipt. The farm is able to improve soil quality, while the waste material is recycled and utilized in an environmentally friendly manner. Records are kept to document the methods and utilization of the non-agricultural products for agricultural purposes. Material is tested once before application. A typical unit is 10-20 tons an acre of municipally collected waste (such as leaf mulch).

**Feature Measure:** Acre of application

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $395.00

**Scenario Cost/Unit:** $197.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 2 | $40.26 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 2 | $115.44 |

**Practice:** 633 - Waste Recycling

**Scenario** #10 - Import Non-Ag Waste By-products, Compost with Manure for Use On Farm

**Scenario Description:**

A farm has soil quality reasource concerns. The farm also has an energy goal to reduce their use of transportation fuels and is interested in utilizing locally available material. The farm is located near a food processor that has excess waste available for recycling. The farm has agreed to receive an amount of waste material which it plans to mix with animal manure solids. This blended waste material will be composted. The finished compost product will be used both for animal bedding and land applied as a soil amendment and nutrient source. The land applied material will comply with the nutrient management plan for agronomic crop nutrient utilization. Records are kept to document the methods and utilization of the non-agricultural products for agricultural purposes. Associated practices: 313-Waste Storage Facility, 317-Composting Facility, 590-Nutrient Management

**Before Situation:**

A farm has a soil quality reasource concerns. The operator also has an energy goal to reduce the farm associated transportation fuels. Additional soil amendments could improve their soil quality but the local fertilizer dealer imports all their material by truck from out of state. Other non-agricultural by-products are locally available but cannot be applied directly on the land. The farm may be able to generate beneficial soil amendments by composting the non-agricultural by-products but does not know the best recipe to use for a compost mix, the time and temperatures required to break down the material or recommended rate of land application .

**After Situation:**

A dairy farm has soil quality resource concerns and plans to improve their soil by utilizing non-agricultural waste materials available locally. The dairy is located near an oyster producer that needs to dispose of excess oyster shells. The calcium in oyster shells can be used to buffer the pH of their soils. The dairy has agreed to receive excess oyster shells which are blended with dairy manure solids and composted. The finished product is laboratory tested to determine the characteristics such as pH and nutrient content. The composted product is used both for dairy bedding and land applied as a soil amendment and nutrient source. Recordkeeping is done for the quantity of non-agricultural material received, ratio blended with manure solids, composting temperatures and times with the corresponding tested sample analysis. Records of the recycled non-agricultural by-products applied to the land is maintained as part of their dairy nutrient management plan.

**Feature Measure:** Cubic Foot

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 400.00

**Scenario Total Cost:** $1,782.12

**Scenario Cost/Unit:** $4.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 6 | $346.32 |

**Practice:** 633 - Waste Recycling

**Scenario** #11 - Import Non-Agricultural By-Products, Land Applied

**Scenario Description:**

A farm has resource concerns about the low soil organic matter content on several fields. The fields are located where a source of municipal green waste may be available. The green, municipal waste could contain material such as food waste, green yard waste and waste from local processing facilities. The farmer agrees to recieve waste materials in bulk two times a year, once in the spring and once in the fall. A blended sample of the waste is tested for nutrients and any potential chemicals of concern. It is then land applied in such a manner that soil organic matter is enhanced, crop nutrents are available and soil compaction is minimized. Records of the tested samples and rates of land application are maintained and accounted for in the nutrient management plan. Associated practices: 590-Nutrient Management, (Temporary Field) Waste Storage

**Before Situation:**

A farm has several fields with low soil organic matter and is located near a community where the local municipality collects green waste. The farmer is concerned about land applying the green waste directly to the fields and that the applied material may tie-up nutrients as well as possible soil compaction issues from equipment the municipality may use for spreading. The farmer wants to make sure the waste material that may be applied is safe and existing soil quality conditions are protected before agreeing to recycle any imported green waste.

**After Situation:**

A farm has low soil organic matter content on several fields and can import non-agricultural green waste material. The farm imports the green waste material that has been chopped and screened for land application. The imported material is briefly stock piled, for no more than 7 days while a blended sample is tested. The sample is tested for nutrient content and any potential chemcials of concern. Based on results of the tested sample and in consultation with an agronomist the waste material is land applied on the agricultural fields. Soil is protected from compaction by applying the waste in an appropiate manner. Records of the sample test and rate of land application in the field are maintained. The sampled test information is used to adjust fertilizer application rates and to prevent crop nutrient tie-up resulting from increased carbon in the soil. The green waste recycling activity on the farm is documented and included in the nutrient management plan records.

**Feature Measure:** Ton

**Scenario Unit:** Ton

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $571.08

**Scenario Cost/Unit:** $28.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $46.24 | 2 | $92.48 |

**Practice:** 634 - Waste Transfer

**Scenario** #1 - Inlet and Reception Pit, less than 1000 gal, with pipe

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume less than 1000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure pipe. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The liquids contain few solids or limited solids that can be easily screened out without blocking the collection intake.

**After Situation:**

This practice scenario is suitable where the estimated design volume for wastewater transfer is less than 1000 gallons of contaminated liquid that may flow from silage bunkers or animal lot areas after a precipitation event. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. With the installation of a precast 5' dia. manhole with lid or catch basin with grate. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area and 150 LF of 6" pipe to transfer liquids to final location, a waste storage facility. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Feature Measure:** Collection volume installed

**Scenario Unit:** Gallons

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $10,511.24

**Scenario Cost/Unit:** $10.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 4 | $1,647.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2 | $1,080.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $11.70 | 150 | $1,755.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 5 | $124.40 |
| Catch Basin, concrete, 60 in dia. | 1754 | Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only. | Each | $4,400.33 | 1 | $4,400.33 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 634 - Waste Transfer

**Scenario** #2 - Inlet and Reception Pit, 1k to 5k gal, with pipe

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume between 1000 and 5000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow pipe. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

**After Situation:**

This practice scenario is suitable where the estimated design volume for waste collection and transfer is between 1000 and 5000 gallons of liquid waste. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling and 150' of 6" pipe to move liquids to final location. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Feature Measure:** Collection volume installed

**Scenario Unit:** Gallons

**Scenario Typical Size:** 4,300.00

**Scenario Total Cost:** $15,879.25

**Scenario Cost/Unit:** $3.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 6 | $2,470.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 14 | $7,564.20 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 12 | $638.52 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 3 | $36.18 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $7.06 | 150 | $1,059.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 12 | $298.56 |
| Safety chain tractor barrier | 1725 | 3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only. | Feet | $3.30 | 40 | $132.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 634 - Waste Transfer

**Scenario** #4 - Medium collection basin with 6 inch transfer line

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect a design volume between 1000 and 5000 gallons of liquids such as silage leachate, lot runoff and other contaminated liquid effluent which is then transferred through a 6" low pressure conduit to the waste storage structure. This scenario includes a reinforced concrete manure reception pit and a 6" PVC SDR 41 conduit to transfer the manure and wastewater to a waste storage pond. Reception Pit includes safety fence w/gate or solid/grated cover. The transfer conduit consists of the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP.

**After Situation:**

This practice scenario is for the estimated design volume for waste collection and transfer of 4300 gallons of liquid waste and can be transferred under gravity or low pressure flow in a 6" PVC pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters at the basin to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The transfer pipeline is assumed to be 300 feet long, 6" PVC gasketted SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design, trench excavation, pipe bedding and backfill. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Feature Measure:** Collection volume installed

**Scenario Unit:** Gallons

**Scenario Typical Size:** 4,300.00

**Scenario Total Cost:** $24,298.90

**Scenario Cost/Unit:** $5.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 6 | $2,470.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 14 | $7,564.20 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 32 | $1,702.72 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 16 | $1,013.28 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 3 | $36.18 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 96 | $3,093.12 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 24 | $816.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 32 | $1,593.92 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 32 | $1,712.32 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 41 | 984 | Materials: - 6 inch - PVC - SDR 41 100 psi - ASTM D2241 | Feet | $6.93 | 330 | $2,286.90 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 18 | $447.84 |
| Safety chain tractor barrier | 1725 | 3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only. | Feet | $3.30 | 40 | $132.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #5 - Large collection basin with 6 to 8 inch transfer line

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this 8600 gallon pit is intended to be transferred to final storage within a 48 hour period. The waste is transferred through an 8" conduit to a waste treatment location. After treatment the remaining liquids are transferred to the waste storage pond in a 6" pipeline. This scenario includes a reinforced concrete manure reception pit an 8" conduit to transfer the manure and wastewater to a treatment location and a secondary 6" transfer pipeline. Reception Pit includes safety fence w/gate or solid/grated cover. The 8" transfer conduit and 6" transfer pipeline consists of the pipe plus the inlet structures connections and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping Plant Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP. Additional waste treatment is required for the waste stream prior to reaching in the waste storage pond.

**After Situation:**

This practice scenario is suitable where the estimated design volume for waste collection and transfer is greater than 5000 gallons of liquid waste and can be transferred under gravity or low pressure flow in an 8" conduit to a waste treatment site. Then the remaining liquids will be transferred in a 6" pipeline to a waste storage pond. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters to collect liquid slurry waste and the installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The first stage transfer pipeline is assumed to be 200 feet long, 8" PVC gasketted SDR 41 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design. The second stage transfer pipe is assumed to be 500 feet long 6" PVC gasketted SDR 41 pipe with an adapter for the wastewater treatment system, couplers, air-vac vents, all other fittings placed as specified by the design.. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Feature Measure:** Collection volume installed

**Scenario Unit:** Gallons

**Scenario Typical Size:** 8,600.00

**Scenario Total Cost:** $40,401.22

**Scenario Cost/Unit:** $4.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 11 | $4,529.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 22 | $11,886.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 40 | $2,128.40 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 12 | $881.88 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 24 | $1,519.92 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 4 | $48.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 140 | $4,510.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 36 | $1,224.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 40 | $1,992.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 41 | 984 | Materials: - 6 inch - PVC - SDR 41 100 psi - ASTM D2241 | Feet | $6.93 | 220 | $1,524.60 |
| Pipe, PVC, 8 in., SDR 41 | 985 | Materials: - 8 inch - PVC - SDR 41 100 psi - ASTM D2241 | Feet | $11.64 | 550 | $6,402.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 23 | $572.24 |
| Safety chain tractor barrier | 1725 | 3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only. | Feet | $3.30 | 60 | $198.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #6 - Concrete channel

**Scenario Description:**

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to an existing collection basin and/or waste storage facility. Acceptable safety system exists or is not needed. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Situation:**

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to an existing collection basin or waste storage facility. Safety system already exists or is not needed. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

**Feature Measure:** Bottom surface area of concrete ch

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,200.00

**Scenario Total Cost:** $19,899.12

**Scenario Cost/Unit:** $16.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 26 | $10,706.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 11 | $5,943.30 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 12 | $638.52 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 4 | $48.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 26 | $646.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #7 - Short Scrape with safety gate, less than 20 LF

**Scenario Description:**

Installation of a short concrete channel (< 20 LF) that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a collection basin and/or waste storage facility at the end of a push-off ramp. A safety gate is installed at the end of the push-off ramp. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Situation:**

Typical installation of a 12 foot wide 15' long concrete channel that consists of a 8" thick concrete slab with curbing on each side of the slab that is 2' high, 8" thick with footing for the entire length. The push-off ramp ends with a Safety gate that swings to allow waste to be moved into the storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,580.41

**Scenario Cost/Unit:** $4,580.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 6 | $2,470.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 2 | $1,080.60 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 2 | $106.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 4 | $124.60 |
| Safety gate, span manure transfer channel or chute | 1952 | Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4 ft. tall with openings that will not pass a 6 inch or larger sphere. Includes materials only. | Feet | $21.93 | 14 | $307.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 634 - Waste Transfer

**Scenario** #8 - Long Scrape with Pushoff, 20LF or greater

**Scenario Description:**

Installation of a long concrete channel (=> 20 LF)that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste into a waste storage facility . A safety gate is installed at the end of the scape channel. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Situation:**

Typical installation of a 12 foot wide 60' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The last 10' is 8" thick at the tank wall for a push-off with safety gate that allows the waste to be moved into the storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

**Feature Measure:** Bottom surface area of concrete ch

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 720.00

**Scenario Total Cost:** $12,111.60

**Scenario Cost/Unit:** $16.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 14 | $5,765.20 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 7 | $3,782.10 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 8 | $425.68 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 5 | $60.30 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 16 | $398.08 |
| Safety gate, span manure transfer channel or chute | 1952 | Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4 ft. tall with openings that will not pass a 6 inch or larger sphere. Includes materials only. | Feet | $21.93 | 14 | $307.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #9 - Concrete channel to Basin

**Scenario Description:**

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a 4300 gallon wastewater collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

**After Situation:**

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to a 8'x12'x6' collection basin or waste storage facility. Includes safety chain around the basin for equipment. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

**Feature Measure:** Bottom surface area of concrete ch

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,200.00

**Scenario Total Cost:** $33,647.16

**Scenario Cost/Unit:** $28.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 22 | $9,059.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 23 | $12,426.90 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 24 | $1,277.04 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 4 | $48.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 28 | $696.64 |
| Safety chain tractor barrier | 1725 | 3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only. | Feet | $3.30 | 50 | $165.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #10 - Concrete Channel to Basin to pipe

**Scenario Description:**

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to a 4300 gallon collection basin and/or waste storage facility. The wastewater is then transferred from the basin to the waste storage pond through a 6" diameter low pressure pipeline. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated. Waste transfer structures are needed to transfer wastes to a waste storage pond

**After Situation:**

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5" thick concrete slab with curbing on each side of the slab that is 2' high, 6" thick with footing for the entire length. The waste transfer scenario is to scrape liquids or manure slurry from the waste production area down the channel to a 8'x12'x6' collection basin. From the basin it is then transferred through a 6" pipe 500 feet to the waste storage pond. The scenario also includes a safety chain around the basin. The transfer pipe is a 6" diameter gasketted PVC SDR 41 low pressure pipeline. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533. Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom. Also pipe size may be increased to meet flow requirements.

**Feature Measure:** Bottom surface area of concrete ch

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,200.00

**Scenario Total Cost:** $40,338.71

**Scenario Cost/Unit:** $33.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 22 | $9,059.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 23 | $12,426.90 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 45 | $288.45 |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 500 | $1,625.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 24 | $1,277.04 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 4 | $48.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 150 | $4,833.00 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 41 | 984 | Materials: - 6 inch - PVC - SDR 41 100 psi - ASTM D2241 | Feet | $6.93 | 550 | $3,811.50 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 28 | $696.64 |
| Safety chain tractor barrier | 1725 | 3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only. | Feet | $3.30 | 50 | $165.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #11 - Small Manure Flush System

**Scenario Description:**

Installation of a manure and wastewater collection system that includes materials and structures to flush waste from a concrete surface into a collection basin and transferred to a waste storage pond. This small flush system must have an adequate source for the flush water and will use an 8" diameter pipe. The system may include flush water tank, piping and valves, concrete flush lane, concrete curbs or gutter, precast manholes, sumps or catch basins. The animal waste will be transferred by a flush cyle released from the flush tank to rinse the concrete surface and carry the waste to a collection basin, into a pipe and to a waste storage pond. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

**Before Situation:**

A small animal production facility does not have an efficient method for collecting and transferring the animal waste produced. A source of sufficient water or wastewater resources are available to design a flush system to clean the production floor and collect the waste materials deposited.

**After Situation:**

This practice scenario is suitable only where the water or wastewater supplies are available for operating a flush system to collect the animal waste deposited on the concrete surfaces. The design flush volume for a small wastewater flush system is less than 1000 gallons and requires no more than 50 feet of an 8 inch diameter pressure pipe for the flush pipe. The scenario includes materials and installation of a flush tank, piping and valves to manage the flush flow, concrete flush lane, concrete curbs or gutters to transfer the flow to a collection basin. The liquids then flow from the basin to the waste storage pond, an estimated length of 200 feet and requires an 8 inch diameter low pressure pipeline with an open outlet to the waste storage pond. The cost includes excavation, placement of bedding aggregate as needed, forming and placement of structures, conveyance pipeline with valves and structural backfill. Pump must be contracted under pumping plant, PS 533.

**Feature Measure:** 1000 Gallons of flush water

**Scenario Unit:** Gallons

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $21,793.08

**Scenario Cost/Unit:** $21.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 7 | $2,882.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 3 | $1,620.90 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 20 | $1,064.20 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 4 | $293.96 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 4 | $253.32 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 4 | $48.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 20 | $996.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 30 | $1,605.30 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 21 | 988 | Materials: - 8 inch - PVC - SDR 21 200 psi - ASTM D2241 | Feet | $20.31 | 55 | $1,117.05 |
| Pipe, PVC, 8 in., SDR 35 | 994 | Materials: - 8 inch - PVC - SDR 35 - ASTM D3034 | Feet | $12.46 | 220 | $2,741.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.50 | 900 | $1,350.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 15 | $373.20 |
| Catch Basin, concrete, 60 in dia. | 1754 | Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only. | Each | $4,400.33 | 1 | $4,400.33 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #12 - Pipe manure flush system

**Scenario Description:**

Installation of the pipe for a manure and wastewater flush system that provides the structures to utilize recycled wastewater to flush waste from a concrete surface into a waste storage pond. This may include pipe and valves, concrete flush lane, concrete curbs or gutter. The animal waste will be transferred by recycled flush water through the pipe system to rinse the concrete production surface and carry the waste to a waste storage pond. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling. This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

**Before Situation:**

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. Wastewater however is available in a sufficient quantity to provide a flush cycle to clean the production floor and collect the waste materials deposited.

**After Situation:**

This practice scenario is suitable where wastewater can be recycled for a flush system. Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete production surfaces. The pipe design for the flush volume requires100 feet of 12 inch diameter pipe for pressure flow. The flushed wastes are then piped from an existing collection basin to the waste storage pond an estimated length of 200 feet through a 12 inch diameter low pressure pipe with an open outlet at the pond. The cost includes excavation, placement of bedding as needed, flush and conveyance pipelines with valves and pipe backfill. Pumps must be contracted under pumping plant, PS 533.

**Feature Measure:** Flush - pipes

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $24,189.45

**Scenario Cost/Unit:** $80.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 8 | $3,294.40 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 66 | $423.06 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 30 | $1,596.30 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 8 | $506.64 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 4 | $48.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 70 | $2,255.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 30 | $1,494.30 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 35 | $1,872.85 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 10 | $303.60 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 6 | $149.28 |
| Pipe, PVC, 12 in., SDR 35 | 1252 | Pipe, PVC, SDR 35, 12 inch Diameter - ASTM D3034. Material cost only. | Feet | $28.42 | 220 | $6,252.40 |
| Pipe, PVC, 12 in., SDR 21 | 1717 | Materials: - 12 inch - PVC - SDR 21 - ASTM D2241 | Feet | $44.36 | 110 | $4,879.60 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #13 - Hopper, over 40ft of 24 inch pipe

**Scenario Description:**

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an inlet structure or hopper with an adaptor to a smooth interior large diameter HDPE pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the inlet structure, transfer pipe plus an and all other fittings, trench excavation and backfill, labor and equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

**After Situation:**

Install an 80 foot long gravity transfer system of a precast collection hopper with an adaptor to a water tight smooth interior 24"diameter HDPE sanitary sewer grade pipe that will flow to an outlet at the site of manure treatment or storage. This scenario includes the collection hopper, pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $14,759.24

**Scenario Cost/Unit:** $184.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 7 | $2,882.60 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 33 | $211.53 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 12 | $1,501.32 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 4 | $48.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 7 | $212.52 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 7 | $174.16 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in. | 1246 | Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $31.96 | 88 | $2,812.48 |
| Catch Basin, concrete, 60 in dia. | 1754 | Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only. | Each | $4,400.33 | 1 | $4,400.33 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #14 - Hopper, with 40 ft or less of 24 inch pipe

**Scenario Description:**

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an inlet structure or hopper with an adaptor to a smooth interior large diameter HDPE pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the inlet structure, transfer pipe plus an and all other fittings, trench excavation and backfill, labor and equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

**After Situation:**

Install an 30 foot long gravity transfer system of a precast collection hopper with an adaptor to a water tight smooth interior 24"diameter HDPE sanitary sewer grade pipe that will flow to an outlet at the site of manure treatment or storage. This scenario includes the collection hopper, pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

**Feature Measure:** LF of 24" pipe

**Scenario Unit:** Feet

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $8,724.32

**Scenario Cost/Unit:** $290.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 15 | $96.15 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 6 | $750.66 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 3 | $36.18 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 2 | $60.72 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 4 | $99.52 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in. | 1246 | Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $31.96 | 33 | $1,054.68 |
| Catch Basin, concrete, 60 in dia. | 1754 | Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only. | Each | $4,400.33 | 1 | $4,400.33 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #15 - 24 inch pipe only

**Scenario Description:**

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an existing inlet structure or hopper with attachment to a smooth interior large diameter pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the pipe attachment to an existing inlet structure and all other fittings, trench excavation and backfill, labor and a equipment for installation. Average cut can range from 4' - 12' in depth. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

**After Situation:**

Install a 150 foot long 24" diameter water tight HDPE pipe to transfer manure by gravity from one location to another. Average cut for site is 8' deep. A gravity transfer system typically consists of a sealed inlet at an existing waste collection structure to a smooth interior 24" sewer grade pipe that will gravity flow to an outlet at a site of manure treatment or storage. This scenario includes the pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. If required an inlet structure may be contracted under another scenario. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 150.00

**Scenario Total Cost:** $14,544.04

**Scenario Cost/Unit:** $96.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1 | $540.30 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 57 | $365.37 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 30 | $3,991.50 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 5 | $60.30 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 13 | $394.68 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24 in. | 1246 | Pipe, Corrugated HDPE Double Wall, 24 inch diameter with soil tight joints - AASHTO M294. Material cost only. | Feet | $31.96 | 160 | $5,113.60 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 634 - Waste Transfer

**Scenario** #16 - 12 inch transfer pipe

**Scenario Description:**

Low pressure flow conduit is typically a PVC pipeline used to transfer wastewater or manure slurry by pumping from one production location to a storage or treatment location. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of no more than 100 psi. The low pressure transfer system typically consists of an inlet structure or hopper connected to a smooth interior PVC pipe sized to deliver the design flow. This practice includes the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and a equipment for installation. This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

**Before Situation:**

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the liquid manure slurry under low pressure from the collection site to the treatment or storage structure.

**After Situation:**

Install a 300 foot long 12 inch diameter low pressure wastewater pipeline to transfer wastewater or manure slurry from one location to another. The low pressure flow situation refers to pipeflow that has an unrestricted outlet and low pumping head pressure. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 12 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the pipe, inlet connection, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer before contracting. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system. The low pressure transfer conduit will provide collection, transfer and containment of the manure slurry, thereby protecting water quality resources.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $16,429.05

**Scenario Cost/Unit:** $54.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 97 | $248.32 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 56 | $358.96 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 24 | $1,277.04 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yards | $12.06 | 7 | $84.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 24 | $816.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 14 | $425.04 |
| Pipe, PVC, 12 in., SCH 40 | 1716 | Materials: 12 inch dia. PVC SCH 40, ASTM D1785 | Feet | $33.06 | 330 | $10,909.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 634 - Waste Transfer

**Scenario** #17 - 10 inch Transfer pipe

**Scenario Description:**

Low pressure flow pipeline used to transfer manure wastewater by a low pressure pump from the waste storage pond to the field where it is applied according to the CNMP. The pipeline moves the water from the pond through a buried mainline with low pressure outlets that spread the water on a vegetated treatment area or to a site where the water is applied through an existing field application system. Low pressure flow PVC transfer pipelines can be between 3" and 30" diameter and are designed for a pumping pressure of 100 psi or less. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

**Before Situation:**

The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.

**After Situation:**

Install a 1000 foot long 10 inch diameter PVC gasketted IPS pipe that has an SDR of 41 and is water tight under low pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pumping pressure and flow volume for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $42,789.45

**Scenario Cost/Unit:** $42.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 1 | $213.84 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 127 | $814.07 |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1000 | $3,250.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 70 | $2,255.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Pipe, PVC, 10 in., SDR 21 | 1714 | Materials: - 10 inch - PVC - SDR 21 - ASTM D2241 | Feet | $31.53 | 1100 | $34,683.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #18 - 6 to 8 inch Pressure Pipe

**Scenario Description:**

Pressure flow pipeline used to transfer manure wastewater by pumping from the waste storage pond to the field where it is to be applied according to the CNMP. Pressure flow transfer pipelines can be between 6" and 8" diameter but 6" diameter is a commonly used pipe size. Pressure pipe will handle an internal pumping pressure between 130 and 200 psi depending on the designed pumping system and must have gasketted joints to seal for the wastewater transfer. The pressure pipe moves the water by pumping from the intake location, through a buried mainline with outlet risers spaced at 60 to 300 ft intervals for a traveler applicator or risers. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

**Before Situation:**

The waste storage structure is separated from the source of wastewater or the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.

**After Situation:**

Install a 1000 foot long 6 inch diameter PVC gasketted IPS pipe that has an SDR of 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $20,588.34

**Scenario Cost/Unit:** $20.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formless, non reinforced | 36 | Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $213.84 | 1 | $213.84 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 90 | $576.90 |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1000 | $3,250.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 70 | $2,255.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 21 | 987 | Materials: - 6 inch - PVC - SDR 21 200 psi - ASTM D2241 | Feet | $12.02 | 1100 | $13,222.00 |

**Practice:** 634 - Waste Transfer

**Scenario** #19 - Transfer line, pressure, 4 inch or less

**Scenario Description:**

Pressure flow pipeline used to transfer manure wastewater by pumping from a small tank to a waste storage or from a waste storage pond to the field where it is to be applied according to the CNMP. Pressure flow transfer pipelines for smaller pumps can be between 1.5" and 6" diameter but 4" diameter is a commonly used pipe size fpr smaller pumping systems. Pressure pipe will handle an internal pumping pressure between 130 and 200 psi depending on the designed pumping system and must have gasketted joints to seal for the wastewater transfer. The pressure pipe moves the water by pumping from the intake riser location, through a buried mainline with outlet risers spaced at 60 to 150 ft intervals for a traveler applicatoror irrigation heads. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

**Before Situation:**

The waste storage structure is separated from the source of wastewater or the application fields where wastewater nutrients are needed. Soil nutrients in the near fields have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field.

**After Situation:**

Install a 500 foot long 4 inch diameter PVC gasketted IPS pipe that has an SDR of 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the manure slurry to a waste storage or to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $5,895.94

**Scenario Cost/Unit:** $11.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 45 | $288.45 |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 375 | $1,218.75 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 35 | $1,127.70 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Pipe, PVC, 4 in., SDR 21 | 986 | Materials: - 4 inch - PVC - SDR 21 200 psi - ASTM D2241 | Feet | $5.54 | 550 | $3,047.00 |

**Practice:** 634 - Waste Transfer

**Scenario** #20 - Agitator for mixing basin contents no more than 10 ft deep

**Scenario Description:**

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the production source to a storage facility for proper utilization. This agitator is typically no more than 15 HP and is used for smaller waste storage facilities that are less than 10 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

**Before Situation:**

In this typical setting, the operator has a small waste storage structure from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

**After Situation:**

The typical installation would be for a small manure 10 HP agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

**Feature Measure:** Agitator for wastewater, installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,258.36

**Scenario Cost/Unit:** $11,258.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 11 | $562.76 |
| **Materials** | | | | | | |
| Manure agitator, mixing depth less than 10 feet. | 1768 | Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only. | Each | $10,695.60 | 1 | $10,695.60 |

**Practice:** 634 - Waste Transfer

**Scenario** #21 - Agitator for mixing basin contents 10 to 15 ft deep

**Scenario Description:**

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 30 HP and is used where the waste storage facility tank or pond is between 10 and 15 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

**Before Situation:**

In this typical setting, the operator has waste production from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

**After Situation:**

A typical installation would be for a medium 30 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

**Feature Measure:** Agitator for wastewater, installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,679.33

**Scenario Cost/Unit:** $12,679.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| **Materials** | | | | | | |
| Manure agitator, mixing depth 10 to 15 feet deep | 1766 | Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only. | Each | $11,727.13 | 1 | $11,727.13 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 634 - Waste Transfer

**Scenario** #22 - Agitator for mixing basin contents over 15 feet deep

**Scenario Description:**

This scenario is for a large manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the storage facility to a site for proper utilization. This agitator is typically 100 HP and is used where the waste storage facility tank or pond is greater than15 feet deep. This scenario does not include a pump. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

**Before Situation:**

In this typical setting, the operator has waste production from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

**After Situation:**

A typical installation would be for a large 100 HP manure agitator to put settled manure solids into suspension for removal from an animal waste storage structure and facilitate the transfer of this material to the next step of waste treatment or utilization. This agitator is for a tank deeper than 15 feet and is part of an animal waste management system to address water quality concerns. This covers the cost of the agitator equipment materials and labor for the electrical hook-up.

**Feature Measure:** Agitator for wastewater, installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $13,900.09

**Scenario Cost/Unit:** $13,900.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| **Materials** | | | | | | |
| Manure agitator, mixing depth greater than 15 feet deep. | 1767 | Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only. | Each | $12,783.23 | 1 | $12,783.23 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #24 - Lot runoff, inlet box, pipe and pump tank

**Scenario Description:**

Installation of a wastewater transfer system that includes materials and structures to transfer silage leachate, lot runoff and other contaminated liquid effluent to a waste storage structure or VTA via a pump or siphon system. This scenario includes a collection box or area to screen and direct flow into a pipe which flows to a settling tank that flows into another tank to hold a pump or siphon which then transfers the wastewater to a waste storage pond or Vegetated Treatment Area. The pump or siphon is contracted under PS 533, Pumping Plant. Distribution systems are contracted as part of the Vegetated Treatment Area PS 635. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS635, Vegetated Treatment Area This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

No method is in-place to collect and direct wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility oe VTA is required for the CNMP.

**After Situation:**

A small collection box is installed at an existing barnyard and waste is transferred under gravity in a 4" dia. PVC pipeline to a settling tank and then a 1,000 gallon pump tank. Elevations require pumping to a waste storage facility or VTA. Transfer pump must be contracted under pumping plant, PS 533.

**Feature Measure:** each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,642.20

**Scenario Cost/Unit:** $7,642.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1 | $411.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1 | $540.30 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 40 | $256.40 |
| Trenching, Earth, clay, 24 in. x 48 in. | 55 | Trenching, earth, clay, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling and shoring/dewatering | Feet | $3.84 | 150 | $576.00 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 6 | $750.66 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 150 | $994.50 |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.50 | 750 | $1,125.00 |
| Collection box, with grate lid | 1755 | Precast concrete box with grate lid for waste transfer sump. Typically 1000-2000 gallon capacity. Materials only. | Each | $1,928.44 | 1 | $1,928.44 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 634 - Waste Transfer

**Scenario** #25 - Lot runoff, Inlet box and pipe

**Scenario Description:**

Installation of a wastewater transfer system that includes materials and structures to transfer silage leachate, lot runoff and other contaminated liquid effluent to a waste storage structure or VTA via gravity. This scenario includes a collection box or area to screen and direct flow into a pipe that then carries the wastewater to a waste storage pond or Vegetated Treatment Area . Distribution systems are contracted as part of the Vegetated Treatment Area PS 635. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS635, Vegetated Treatment Area This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

**Before Situation:**

No method is inplace to collect and direct wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility or VTA is required for the CNMP.

**After Situation:**

A small collection box is installed adjacent to an existing barnyard and liquid waste is transferred via gravity in a 4" dia. PVC pipeline to a waste storage facility or VTA. Typical systems distance is 300'.

**Feature Measure:** each

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,489.14

**Scenario Cost/Unit:** $3,489.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 1 | $411.80 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1 | $540.30 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 1 | $53.21 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1 | $34.02 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 300 | $1,989.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 634 - Waste Transfer

**Scenario** #26 - Boring , Waste Transfer Pipe, All sizes

**Scenario Description:**

A section of the waste transfer pipe is bored under road or stream using seamless pipe that meets or exceeds main undergound outlet size and pressure rating. Site location does not allow for open trench. (I.e., No permit can be obtained for open trench on road crossing and/or digging open trench across stream) Bore 100 feet of 8 - inch, Pipeline. Appurtenances include: couplings and fittings to connect to planned pipeline and are included in the cost of pipe material (additional 10% of pipe material quantity). The scenario unit is linear feet of bored pipe from coupler to coupler. This practices is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices. Associated practices are Critical Area Planting (342), Grassed Waterway ( 412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606), Structure for Water Control (587)

**Before Situation:**

No method is inplace to collect and direct wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility or VTA is required for the CNMP.

**After Situation:**

Install a 100 foot long section of 8 inch diameter pipe under road or stream as part of a waste transfer piping system. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. This is part of the transfer pipeline that will deliver the wastes to the final destination of a storage, vegetated treatment area, or hauling equipment. Part of a system to deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

**Feature Measure:** Length of conduit

**Scenario Unit:** Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $16,110.04

**Scenario Cost/Unit:** $161.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| Horizontal Boring, Greater Than 3 in. diameter | 1132 | Includes equipment, labor and setup. | Feet | $126.18 | 100 | $12,618.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 21 | 988 | Materials: - 8 inch - PVC - SDR 21 200 psi - ASTM D2241 | Feet | $20.31 | 110 | $2,234.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 634 - Waste Transfer

**Scenario** #29 - Drag Hose

**Scenario Description:**
Installation of flexible hose to transfer waste from storage to field for application.

**Before Situation:**
Currently waste is applied by tanker. Application is energy inefficient, causes excessive soil compaction, and often does not coincide with optimal application timing.

**After Situation:**
Drag hose installation allows transfer of waste from storage to field where it can be directly injected or applied through a hard hose reel irrigation system. Tanker traffic is reduced on road and in field, increasing energy efficiency, reducing soil compaction, and increasing opportunities for optimal application method and timing.

**Feature Measure:** Feet of Drag Hose

**Scenario Unit:** Feet

**Scenario Typical Size:** 5,000.00

**Scenario Total Cost:** $52,282.22

**Scenario Cost/Unit:** $10.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Drag Hose | 2645 | Soft, flexible 5 inch thermoplastic polyurethane hose, resistant to soil abrasion when moved on top of ground. Used to transfer separated liquid waste for field application. Includes materials and shipping only. | Linear Feet | $10.45 | 5000 | $52,250.00 |

**Practice:** 634 - Waste Transfer

**Scenario** #30 - Hard Hose Reel

**Scenario Description:**

Hard Hose Reel is installed at main Waste Transfer line in field to distribute waste to application apparatus.

**Before Situation:**

Currently waste is applied by tanker during non growing season. Tanker application is energy inefficient, does not coincide with optimal crop nutrient uptake, and cause excessive soil compaction.

**After Situation:**

Use of Hard Hose Reel allows waste to be pumped to point of application. Can be used in growing row crops. Heavy tankers are eliminated from roads and fields. Soil compaction reduced, energy saved, and crop utilization of waste is maximized reducing potential runoff and leaching of nutrients.

**Feature Measure:** Feet of Hard Hose Reel

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $35,482.22

**Scenario Cost/Unit:** $35.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Hard Hose and Reel System, >3 in. dia. | 2442 | Hard hose and reel system with > 3 inch nominal size hose. This includes the hard hose and reel only. Normal hose length 1320'. | Feet | $35.45 | 1000 | $35,450.00 |

**Practice:** 634 - Waste Transfer

**Scenario** #31 - 6 to 8 inch Transfer pipe

**Scenario Description:**

Low pressure, gravity flow pipeline used to transfer manure wastewater from source to a waste storage facility or reception pit. Typical PVC pipe size is 6 to 8 inches. This practice includes the pipe plus an inlet attachments, clean-out risers and outlet connections plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

**Before Situation:**

The waste source is separated from the final destination or temporary holding facility. Soil nutrients at current outlet area are in excessive levels with potential to pollute both surface and subsurface waters. The current situation does not allow proper collection and can cause water quality concerns.

**After Situation:**

Install a 1000 foot long 6 inch diameter SDR 35 pipe to allow waste waster to flow from a outlet at a barnyard HUA with existing inlet screens to a waste storage facility. System is gravity flow with one cleanout riser at midpoint.. This scenario includes the pipe, inlet connections, couplers, and all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding material needed and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the wastes to a then be latter utilized according to the CNMP, thereby protecting water quality resources.

**Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $15,926.80

**Scenario Cost/Unit:** $15.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 300 | $1,263.00 |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 1000 | $3,250.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SDR 35 | 993 | Materials: - 6 inch - PVC - SDR 35 - ASTM D3034 | Feet | $7.06 | 1100 | $7,766.00 |

**Practice:** 634 - Waste Transfer

**Scenario** #32 - Transfer Pipe, gravity, 4 inch or less

**Scenario Description:**

Low pressure, gravity flow pipeline used to transfer manure wastewater from source to a waste storage facility or reception pit. Typical PVC pipe size is 2 to 4 inches. This practice includes the pipe plus an inlet attachments, clean-out risers and outlet connections plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. Appurtenances include: couplings, fittings, air vents, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area. "

**Before Situation:**

The waste source is separated from the final destination or temporary holding facility. Soil nutrients at current outlet area are in excessive levels with potential to pollute both surface and subsurface waters. The current situation does not allow proper collection and can cause water quality concerns.

**After Situation:**

Install a 200 foot long 4 inch diameter PVC pipe to allow waste waster to flow from a outlet at a milkhouse to a waste storage facility. System is gravity flow with one cleanout riser at midpoint.. This scenario includes the pipe, inlet connections, couplers, and all other fittings, and risers placed as specified by the design, trench excavation, native soil pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. The transfer pipeline will deliver the wastes to a then be latter utilized according to the CNMP, thereby protecting water quality resources.

**Feature Measure:** Linear foot

**Scenario Unit:** Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $1,893.74

**Scenario Cost/Unit:** $9.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 60 | $252.60 |
| Trenching, Earth, loam, 24 in. x 48 in. | 54 | Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling | Feet | $3.25 | 200 | $650.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Pipe, PVC, 4 in., SDR 35 | 992 | Materials: - 4 inch - PVC - SDR 35 - ASTM D3034 | Feet | $3.14 | 220 | $690.80 |

**Practice:** 634 - Waste Transfer

**Scenario** #33 - Wastewater reception pit, 670 to 4999 CF

**Scenario Description:**

This scenario consists of installing a small concrete tank with a design storage volume from 670 to 4,999 CF that is totally or partially buried and has solid lid with several openings for direct loading from heavy use area, gutter cleaner or gravity pipe. Wastes are held for 3 to 14 day on smaller operations or transferred to larger storage facility or direct land applied. Perimeter line included for leak detection and ground water control to observation well. Payment volume based on struck full. Design volume does not include freeboard. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Flexible Membrane (521A), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Solid/Liquid Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533),and Underground Outlet (620) Waste Storage Facility(313). "

**Before Situation:**

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

**After Situation:**

" Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. Tank typically 8' deep x 12' wide x 40' long, with a design storage volume of 3,600 cubic feet plus 6"" freeboard. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Design Volume does not include 6"" of freeboard. Tanks associated with open lots sized to handle design storm in tank or in combination with lot as per state regulations. Payment based on Struck full volume = 3,840 CF"

**Feature Measure:** cubic foot of storage struck full

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 3,840.00

**Scenario Total Cost:** $33,976.23

**Scenario Cost/Unit:** $8.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 12 | $4,941.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 36 | $19,450.80 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yards | $6.41 | 150 | $961.50 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 14 | $1,751.54 |
| Truck, Concrete Pump | 1211 | Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equi | Hours | $149.24 | 9 | $1,343.16 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 14 | $697.34 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 12 | $373.80 |
| Aggregate, gravel, washed, pea gravel | 1331 | Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $34.53 | 16 | $552.48 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 6 in. | 2202 | Pipe, Corrugated HDPE Double Wall 6 inch diameter with water tight joints meeting ASTM F477. Material cost only. | Feet | $4.22 | 104 | $438.88 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 3 | $208.32 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 5 | $2,400.65 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario** #1 - Graded Area, Gravity Flow Surface Application

**Scenario Description:**

This is a permanent herbaceous vegetative area or channel installed down slope from a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected and released with a controlled gravity outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 1.0 ac in size, includes a gravel trench for distribution flow (sheet flow) into the VTA. Typically requires grading and shaping, seeding, gravel spreader trenches and perforated pipe to maintain sheet flow throughout the VTA. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Feature Measure:** Amount of VTA installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 43,560.00

**Scenario Total Cost:** $8,381.76

**Scenario Cost/Unit:** $0.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 400 | $568.00 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 70 | $179.20 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 16 | $1,175.84 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 70 | $2,180.50 |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 30 | $37.20 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 30 | $30.30 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 30 | $17.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 45 | $101.25 |
| Coupling, PVC, endcap, 2 in., SCH 20 | 1727 | 2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $0.91 | 15 | $13.65 |
| Pipe, PE, 6 in., DR 9, perforated | 1728 | Materials: - 6 inch - Perforated PE - 160 psi - ASTM D3035 DR 9 | Feet | $39.39 | 80 | $3,151.20 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario** #2 - Graded Area, Pumped Into A Basin, Gravity Flow Surface Application

**Scenario Description:**

This is a permanent herbaceous vegetative area or channel located upslope from the livestock production area. The topography of the site requires wastewater to be pumped uphill to the VTA designed system. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped uphill to a shallow tank or basin where it has a controlled gravity outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629).

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 1.0 ac in size, includes the installation site to be upslope from the production area with a shallow tank or basin that provides a controlled gravity outflow into the VTA. Typically requires grading and shaping, seeding, gravel spreader trenches and perforated pipe to maintain sheet flow throughout the VTA. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater upslope to the VTA distribution point. For milk house waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being released into the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Feature Measure:** Amount of VTA installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 43,560.00

**Scenario Total Cost:** $15,447.02

**Scenario Cost/Unit:** $0.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, slab on grade, reinforced | 37 | Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $411.80 | 2 | $823.60 |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 12 | $6,483.60 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 400 | $568.00 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 100 | $256.00 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 6 | $182.16 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 70 | $2,180.50 |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 30 | $37.20 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 30 | $30.30 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 30 | $17.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 45 | $101.25 |
| Ball Valve, 4 in. | 1726 | 4 inch ball valve, metal body. Materials only. | Each | $302.75 | 2 | $605.50 |
| Coupling, PVC, endcap, 2 in., SCH 20 | 1727 | 2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $0.91 | 15 | $13.65 |
| Pipe, PE, 6 in., DR 9, perforated | 1728 | Materials: - 6 inch - Perforated PE - 160 psi - ASTM D3035 DR 9 | Feet | $39.39 | 80 | $3,151.20 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario** #3 - Vegetated Treatment Area with Minor Grading

**Scenario Description:**

This is a proposed permanent herbaceous vegetative area located adjacent to a livestock production area needs to be re-graded before use. Distribution is directly off the barnyard across the lower end. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 0.5 ac in size, includes the sizing, grading and shaping and seeding of the VTA area. Requires grading and shaping to maintain sheet flow onto the VTA. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater to the VTA mechanical distribution component that is contracted using Irrigation System, Sprinkler (442). For milk house waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being pumped and distributed onto the VTA via a spreader pipe across top of VTA . An option for small barnyards can use slotted curbs to distribute across top side. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

**Feature Measure:** Amount of VTA installed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 21,780.00

**Scenario Total Cost:** $3,827.39

**Scenario Cost/Unit:** $0.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 0.5 | $6.61 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 0.5 | $3.63 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 0.5 | $11.14 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 0.5 | $4.55 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 37.5 | $1,168.13 |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 15 | $18.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 15 | $15.15 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 15 | $8.85 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 1 | $109.15 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 150 | $994.50 |
| Ball Valve, 4 in. | 1726 | 4 inch ball valve, metal body. Materials only. | Each | $302.75 | 2 | $605.50 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 0.5 | $42.21 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario** #4 - Existing Vegetative Area, Gravity Flow Surface Application

**Scenario Description:**

An existing permanent herbaceous vegetated area that meets the requirements for a VTA and is used as an overland flow area for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA. Clean runoff is diverted where possible. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich runoff that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment Area (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is 1.0 ac in size, includes a gravel trenchs and perforacted pipe to establish sheet flow into the VTA where and existing permanent herbaceouse vegetated area meets the requirements for a VTA. Does not include any grading or seeding. The VTA practice will provide a controlled release of nutrient rich runoff into an existing vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich runoff and prevent contamination of surface and ground water resources.

**Feature Measure:** Amount of VTA treating wastewate

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 43,560.00

**Scenario Total Cost:** $11,895.32

**Scenario Cost/Unit:** $0.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 7 | $3,782.10 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 445 | $631.90 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 75 | $192.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 75 | $2,336.25 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 40 | $90.00 |
| Coupling, PVC, endcap, 2 in., SCH 20 | 1727 | 2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $0.91 | 20 | $18.20 |
| Pipe, PE, 6 in., DR 9, perforated | 1728 | Materials: - 6 inch - Perforated PE - 160 psi - ASTM D3035 DR 9 | Feet | $39.39 | 100 | $3,939.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario** #5 - VTA using an Existing Vegetative Area with Gated pipe or sprinkler system

**Scenario Description:**

An existing permanent herbaceous vegetated area that meets the requirements for a VTA and is used as an overland flow area for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA or a fixed sprinkler setup is installed. Clean runoff is diverted where possible. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich runoff that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment Area (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical VTA is .5 ac in size, includes perforated pipe to establish sheet flow into the VTA where and existing permanent herbaceouse vegetated area meets the requirements for a VTA. Does not include any grading or seeding. The VTA practice will provide a controlled release of nutrient rich runoff into an existing vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich runoff and prevent contamination of surface and ground water resources.

**Feature Measure:** SF

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 22,500.00

**Scenario Total Cost:** $3,277.36

**Scenario Cost/Unit:** $0.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 37.5 | $1,168.13 |
| Pipe, PVC, 4 in., SCH 40 | 978 | Materials: - 4 inch - PVC - SCH 40 - ASTM D1785 | Feet | $6.63 | 150 | $994.50 |
| Ball Valve, 4 in. | 1726 | 4 inch ball valve, metal body. Materials only. | Each | $302.75 | 2 | $605.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario** #6 - VTA with 1 ft of new soil and complex distribution

**Scenario Description:**

An existing site for the permanent herbaceous vegetated area does not meets the requirements for a VTA due to high phosphorous levels in existing top 12". No other options. Remove and replace upper 12" with low phosphorous soil. Then install distribution system for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA. Clean runoff is diverted where possible. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich runoff that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment Area (629) Critical area seeding(342)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical application is a VTA that is 1.0 ac in size, includes removing upper 12" of soil and replacing with new 12" topsoil then installing a gravel trenches and perforated pipe to establish sheet flow into the VTA. New vegetation is established on new soil. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). The VTA practice will provide a controlled release of nutrient rich runoff into an existing vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich runoff and prevent contamination of surface and ground water resources.

**Feature Measure:** SF of VTA

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 43,560.00

**Scenario Total Cost:** $20,632.33

**Scenario Cost/Unit:** $0.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 7 | $3,782.10 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 445 | $631.90 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 75 | $192.00 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 1935 | $7,024.05 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1613 | $1,467.83 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 75 | $2,336.25 |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 30 | $37.20 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 30 | $30.30 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 30 | $17.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 40 | $90.00 |
| Coupling, PVC, endcap, 2 in., SCH 20 | 1727 | 2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $0.91 | 20 | $18.20 |
| Pipe, PE, 6 in., DR 9, perforated | 1728 | Materials: - 6 inch - Perforated PE - 160 psi - ASTM D3035 DR 9 | Feet | $39.39 | 100 | $3,939.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 3 | $208.32 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 635 - Vegetated Treatment Area

**Scenario** #7 - VTA with 3 ft of new soil and complex distribution

**Scenario Description:**

An existing site for the permanent herbaceous vegetated area does not meet the requirements for a VTA due to insufficient soil depth to limiting material. No other options. Strip topsoil and add 3' of new sub-base. Then install distribution system for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA. Clean runoff is diverted where possible. The VTA vegetation is harvested to remove nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich runoff that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Solid/Liquid Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment Area (629)

**Before Situation:**

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

**After Situation:**

Typical application is a VTA that is 1.0 ac in size, includes removing topsoil and bringing in 3' of soil and re-spreading topsoil. Then installing a gravel trenches and perforated pipe to establish sheet flow into the VTA. Width of 100' by 436' long. New vegetation established on new topsoil. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). The VTA practice will provide a controlled release of nutrient rich runoff into an existing vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich runoff and prevent contamination of surface and ground water resources.

**Feature Measure:** SF of VTA

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 43,560.00

**Scenario Total Cost:** $48,237.81

**Scenario Cost/Unit:** $1.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 7 | $3,782.10 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $1.42 | 445 | $631.90 |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 75 | $192.00 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 5808 | $21,083.04 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 4 | $403.76 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 1080 | $982.80 |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 4840 | $13,697.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 75 | $2,336.25 |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 30 | $37.20 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 30 | $30.30 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 30 | $17.70 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 2 | $218.30 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pipe, PVC, 2 in., SCH 40 | 976 | Materials: - 2 inch - PVC - SCH 40 - ASTM D1785 | Feet | $2.25 | 40 | $90.00 |
| Coupling, PVC, endcap, 2 in., SCH 20 | 1727 | 2 inch - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $0.91 | 20 | $18.20 |
| Pipe, PE, 6 in., DR 9, perforated | 1728 | Materials: - 6 inch - Perforated PE - 160 psi - ASTM D3035 DR 9 | Feet | $39.39 | 100 | $3,939.00 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 636 - Water Harvesting Catchment

**Scenario** #14 - Surface Catchment

**Scenario Description:**

Construct an apron, approximately 50 feet wide by 90 feet long, utilizing: a plastic or rubber membrane laid on a prepared ground surface; or an asphalt or concrete surface with curbing; to collect rain water. Divert collected water from the surface catchment by gravity through an 8" diameter, PVC SDR-35 pipe to an existing tank or plastic-lined earthen reservoir. Exclusion of animals is required, so conservation practice 382 - Fencing, may be needed to protect the catchment. Resource Concern: Livestock production limitation - Inadequate livestock water. Associated Practices: 382 - Fencing; 614 - Watering Facility; 436 - Irrigation Reservoir; and 521A - Pond Sealing or Lining, Flexible Membrane.

**Before Situation:**

Inadequate water available to address resource concerns. Client hauls water to supply needs.

**After Situation:**

Design and construct an impervious surface as the primary collection component, and a pipe to convey the water to create a reliable water supply for livestock.

**Feature Measure:** Surface Area of Catchment

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $9,177.99

**Scenario Cost/Unit:** $18.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 12 | $881.88 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| **Materials** | | | | | | |
| Pipe, PVC, 8 in., SDR 35 | 994 | Materials: - 8 inch - PVC - SDR 35 - ASTM D3034 | Feet | $12.46 | 140 | $1,744.40 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $7.29 | 500 | $3,645.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 636 - Water Harvesting Catchment

**Scenario** #15 - Elevated Catchment

**Scenario Description:**

Build a wooden frame, "post-and-pier" structure, with a corrugated metal roof (dimensions are 24 feet wide by 20 feet long), to collect rain water. The structure is supported by 9-each, "poured-in-place", concrete footings (dimensions are 2'x2' square x1' thick), 8 feet on-center, with tie-down straps. Divert collected water from catchment area with guttering and downspout through a 4" diameter PVC Schedule 40 pipe, to a tank (not included )for a reliable storage and subsequent use. Resource concerns: Livestock production limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water. Associated practices: 382 - Fence; 614 - Watering Facility; or 436 - Irrigation Reservoir.

**Before Situation:**

Inadequate water available to address resource concerns. Client hauls water to supply needs.

**After Situation:**

The guttering and downspouts collects the roof runoff and the water is conveyed through a pipe, by gravity, to a storage tank for use by livestock or a very small irrigation system. This system is the primary collection component of a Water Harvesting Catchment (CPS 636) facility. Divert collected water from roof with guttering and downspout through a 4" diameter PVC Sch-40 pipe,

**Feature Measure:** Surface Area of Catchment

**Scenario Unit:** Square Yard

**Scenario Typical Size:** 53.00

**Scenario Total Cost:** $11,569.69

**Scenario Cost/Unit:** $218.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Concrete, CIP, formed reinforced | 38 | Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. | Cubic Yards | $540.30 | 1.5 | $810.45 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 120 | $6,139.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 1 | $49.81 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| **Materials** | | | | | | |
| Pipe, PVC, 6 in., SCH 40 | 980 | Materials: - 6 inch - PVC - SCH 40 - ASTM D1785 | Feet | $11.70 | 60 | $702.00 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners | Board Feet | $2.39 | 512 | $1,223.68 |
| Gutter, Downspout, PVC, 5 in. | 1388 | 5 inch PVC guttering. Materials only. | Feet | $1.66 | 24 | $39.84 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 636 - Water Harvesting Catchment

**Scenario** #18 - Poly Tank, Small, 1000 gallons or less

**Scenario Description:**

Install a small (typically 1000 gallons or less) above-ground poly tank to collect rain water an impervious surface (not an existing roof). Stored water can be used with watering facilities, irrigation systems, or other conservation practices. The tank shall be constructed of approved materials that stores adequate quantity and quality of water for storage and or direct drinking access. Additional components may be needed to channel water from the impervious surface to the storage tank. All components used will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Resource concerns addressed include: Inadequate water quantity for livestock, wildlife or crops; habitat degradation, water quality, and undesirable plant productivity and health. Associated Practices: 614 - Watering Facility; 516 - Livestock Pipeline; 558 - Roof Runoff Structure; 620 - Underground Outlet; 430 - Irrigation Pipeline; 441 - Micro Irrigation; 533 - Pumping Plant; 342 - Critical Area Planting; 382 - Fencing

**Before Situation:**

Impervious surface currently exists, but there is no storage available. Water is not available in sufficient quantity or at the required times to provide for wildlife, livestock watering, irrigation, or for other conservation practices. This practice applies to all land uses where there is a need for new or improved watering facilities for livestock, wildlife and or other conservation practices; where water is not available in sufficient quantities at specific locations; and habitat, water quality, plant productivity and health needs to be improved.

**After Situation:**

A 750 gallon above-ground Poly tank with all tank materials, tank plumbing and float valve is installed to collect water from an impervious surface. Tank will provide adequate water storage capacity to ensure against inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, water quantity, crops, and undesirable plant productivity and health.

**Feature Measure:** Gallons of Tank Storage Capacity

**Scenario Unit:** Gallons

**Scenario Typical Size:** 750.00

**Scenario Total Cost:** $3,055.49

**Scenario Cost/Unit:** $4.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 6 | $319.26 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| **Materials** | | | | | | |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.50 | 750 | $1,125.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 1.2 | $29.86 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 636 - Water Harvesting Catchment

**Scenario** #20 - Plastic tank, less than or equal to 1,000 gallons

**Scenario Description:**

Install a small, typically 1,000 gallons or less, above-ground polyethylene tank to store rainwater from an impervious surface on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad. The typical dimensions of the tank are 72" in diameter and 66" tall. The scenario also assumes a 96" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. Stored water can be used with watering facilities, irrigation systems, or other conservation practices. The tank shall be constructed of approved materials that stores adequate quantity and quality of water for storage and or direct drinking access. Additional components may be needed to channel water from the impervious surface to the storage tank. All components used will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Resource concerns addressed include: Inadequate water quantity for livestock, wildlife or crops; habitat degradation, water quality, and undesirable plant productivity and health. Associated Practices: 614 - Watering Facility; 516 - Livestock Pipeline; 558 - Roof Runoff Structure; 620 - Underground Outlet; 430 - Irrigation Pipeline; 441 - Micro Irrigation; 533 - Pumping Plant; 342 - Critical Area Planting; 382 - Fencing

**Before Situation:**

Impervious surface currently exists, but there is no storage available. Water quantity is not available or supplemented to provide for wildlife, livestock watering, irrigation, or for other conservation practices.

**After Situation:**

A 1,000 gallon above-ground Poly tank with all tank materials, stabilized in place, with overflow protection, is installed to collect and store water from an impervious surface. Tank will provide or support adequate water storage capacity to ensure against inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, water quantity, crops, and undesirable plant productivity and health, and provide conservation benefit.

**Feature Measure:** Gallons of Tank Storage Capacity

**Scenario Unit:** Gallons

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $2,161.23

**Scenario Cost/Unit:** $2.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 1 | $89.72 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hours | $15.45 | 1 | $15.45 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallons | $1.50 | 1000 | $1,500.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $24.88 | 1 | $24.88 |
| Cable, Galvanized steel | 2182 | Galvanized steel aircraft cable in 7 x 19 strand core. Materials and shipping only. | Feet | $0.62 | 40 | $24.80 |
| Anchor, earthen, low disturbance, large | 2184 | Low disturbance, galvanized or aluminum alloy earthen anchors with holding power greather than 3,000 pounds in normal soil. Materials and shipping only. | Each | $51.19 | 4 | $204.76 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 638 - Water and Sediment Control Basin

**Scenario** #1 - WASCOB > 100 LF Embankment

**Scenario Description:**

An earth embankment or a combination ridge and channel constructed across the slope of minor watercourses to form a sediment trap and water detention basin with a stable outlet. The typical scenario is for the construction of an embankment with sufficient capacity to control the runoff from a 10-year frequency, 24-hour duration storm using a combination of flood storage and discharge through the outlet. Sediment removal from the basin will be handled by an Operation and Maintenance Plan. The typical embankment is 150 feet long, 4 foot high, 3 foot top width, 5:1 side slopes, constructed from on-site fill, compacted by the construction equipment. A core trench is used to intercept seepage. The outlet is typically a standpipe with underground outlet. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Associated Practices: Critical Area Planting (342), Underground Outlet (620)

**Before Situation:**

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

**After Situation:**

A 150 foot long embankment is constructed with 755 CY of excavation/earthfill with a dozer to build a Water and Sediment Control Basin . Rill and/or gully erosion is reduced.

**Feature Measure:** Length of WASCOB Embankment in

**Scenario Unit:** Feet

**Scenario Typical Size:** 150.00

**Scenario Total Cost:** $3,391.00

**Scenario Cost/Unit:** $22.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 20 | $2,018.80 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 81 | $73.71 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.08 | $28.49 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.04 | $12.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.04 | $10.08 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 20 | $996.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 638 - Water and Sediment Control Basin

**Scenario** #2 - WASCOB < 100 Feet

**Scenario Description:**

An earth embankment or a combination ridge and channel constructed across the slope of minor watercourses to form a sediment trap and water detention basin with a stable outlet. The typical scenario is for the construction of an embankment with sufficient capacity to control the runoff from a 10-year frequency, 24-hour duration storm using a combination of flood storage and discharge through the outlet. Sediment removal from the basin will be handled by an Operation and Maintenance Plan. The typical embankment is 75 feet long, 3 foot high, 3 foot top width, 5:1 side slopes, constructed from on-site fill, compacted by the construction equipment. A core trench is used to intercept seepage. The outlet is typically a standpipe with underground outlet. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Associated Practices: Critical Area Planting (342), Underground Outlet (620)

**Before Situation:**

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

**After Situation:**

A 75 foot long embankment is constructed with 300 CY of excavation/earthfill with a dozer to build a Water and Sediment Control Basin . Rill and/or gully erosion is reduced.

**Feature Measure:** Length of WASCOB Embankment in

**Scenario Unit:** Feet

**Scenario Typical Size:** 75.00

**Scenario Total Cost:** $2,121.37

**Scenario Cost/Unit:** $28.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 12 | $1,211.28 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 39 | $35.49 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.04 | $14.24 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.02 | $6.13 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.02 | $5.04 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 638 - Water and Sediment Control Basin

**Scenario** #10 - WASCOB topsoil

**Scenario Description:**

Typical scenarios for the construction of 700 CY earthen embankment. Prior to building the embankment, 6 inches of topsoil is removed and stockpiled. Outlet is typically an underground outlet. An earthen embankment or combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Topsoil is replaced following construction of the embankment. Costs include all equipment necessary to strip and stock pile topsoil, excavate, shape, grade and compact the Water and Sediment Control Basin, spread and replace topsoil after construction and mobilization of equipment. Seeding not included. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Work is done with dozer, scraper, or road grader.

**Before Situation:**

Site has shallow topsoil which if removed by earthwork for construction of embankment will significantly impact yields. Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) is being transported into the riparian areas and water bodies downstream.

**After Situation:**

Water and Sediment Control Basis is constructed with 700 CY of excavation/earthfill with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

**Feature Measure:** CY of WASCOB Embankment

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 700.00

**Scenario Total Cost:** $2,513.48

**Scenario Cost/Unit:** $3.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 250 | $227.50 |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 700 | $1,981.00 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #1 - 4 inch cased

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. An average well depth is 250 feet. Well casings are 4" in diameter. Steel casing is installed to a depth of 110 feet.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

**After Situation:**

Install a 250' deep well with 110' of 4" casing. Casing grouted to seal out surface water. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities. All measurements from top of casing.

**Feature Measure:** Total depth of well

**Scenario Unit:** Feet

**Scenario Typical Size:** 250.00

**Scenario Total Cost:** $9,007.16

**Scenario Cost/Unit:** $36.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 6 | $2,137.02 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 3 | $2,295.63 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 4 in. | 1785 | Well cap, 4 inch. Materials only. | Each | $34.77 | 1 | $34.77 |
| Well Casing, Metal, 4 in. | 1809 | Steel well casing, 4 inch. Materials only. | Feet | $19.47 | 110 | $2,141.70 |
| Aquifer Flow Test | 1817 | High-volume aquifer flow test. Includes labor and equipment. | Hours | $196.79 | 8 | $1,574.32 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #2 - 4 inch Limited Casing

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. The area is known for swallow wells and minimal depth to bedrock. An average well depth is 150 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 30 feet.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

**After Situation:**

Install a 150' deep well with 30' of 4" casing. Casing grouted to seal out surface water. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities. All measurements from top of casing.

**Feature Measure:** Total depth of well

**Scenario Unit:** Feet

**Scenario Typical Size:** 150.00

**Scenario Total Cost:** $4,619.90

**Scenario Cost/Unit:** $30.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 4 | $1,424.68 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 1 | $765.21 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 4 in. | 1785 | Well cap, 4 inch. Materials only. | Each | $34.77 | 1 | $34.77 |
| Well Casing, Metal, 4 in. | 1809 | Steel well casing, 4 inch. Materials only. | Feet | $19.47 | 30 | $584.10 |
| Aquifer Flow Test | 1817 | High-volume aquifer flow test. Includes labor and equipment. | Hours | $196.79 | 6 | $1,180.74 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #3 - Typical Well, 6 inch

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 150 feet.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

**After Situation:**

Install a 400' deep well with 150' of 6" casing. Casing grouted to seal out surface water. Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities. All measurements from top of casing.

**Feature Measure:** Total depth of well

**Scenario Unit:** Feet

**Scenario Typical Size:** 400.00

**Scenario Total Cost:** $14,438.88

**Scenario Cost/Unit:** $36.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 8 | $2,849.36 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 5 | $3,826.05 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $52.34 | 1 | $52.34 |
| Well Casing, Metal, 6 in. | 1810 | Steel well casing, 6 inch. Materials only. | Feet | $33.74 | 150 | $5,061.00 |
| Aquifer Flow Test | 1817 | High-volume aquifer flow test. Includes labor and equipment. | Hours | $196.79 | 8 | $1,574.32 |
| Well Screen, stainless steel, 6 in. | 1995 | 6 inch Stainless steel well screen. Materials only. | Feet | $123.21 | 1 | $123.21 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #4 - High Volume Typical Well, 8 inch or greater

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation.

**Before Situation:**

There is insufficient water for use in irrigation.

**After Situation:**

A well is drilled with 150' feet of 8" casing and a total depth of 500'. Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities. All measurements from top of casing.

**Feature Measure:** Total depth of well

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $29,184.77

**Scenario Cost/Unit:** $58.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 32 | $11,397.44 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 64 | $2,062.08 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 7 | $5,356.47 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 8 in. | 1787 | Well cap, 8 inch. Materials only. | Each | $82.10 | 1 | $82.10 |
| Well Casing, Metal, 8 in. | 1811 | Steel well casing, 8 inch. Materials only. | Feet | $50.78 | 150 | $7,617.00 |
| Aquifer Flow Test | 1817 | High-volume aquifer flow test. Includes labor and equipment. | Hours | $196.79 | 12 | $2,361.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #60 - 4 inch well cased, PVC, Shallow

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. An average well depth is 100 feet. Well casings are 4" in diameter. Well screening is 30' in length.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in irrigation.

**After Situation:**

Install a 100' deep well with 70' of 4" PVC casing and 30' of screening. Casing grouted to seal out surface water to a depth of 30 feet. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** Total depth of well

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,754.23

**Scenario Cost/Unit:** $47.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 8 | $2,849.36 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 0.3 | $229.56 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 4 in. | 1785 | Well cap, 4 inch. Materials only. | Each | $34.77 | 1 | $34.77 |
| Well Casing, Plastic, 4 in. | 1803 | PVC or ABS non-threaded well casing, 4 inch. Materials only. | Feet | $5.72 | 70 | $400.40 |
| Well Screen, plastic, 4 in. | 1998 | 4 inch PVC well screen. Materials only. | Feet | $9.19 | 30 | $275.70 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #61 - 10 inch well cased, PVC, Shallow well

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. Well is typically cased 70% of the depth and the remaining 30% is screened.

**Before Situation:**

There is insufficient water for livestock or irrigation.

**After Situation:**

A well is drilled with 70 feet of 10" casing and 30 feet of well screening for a total depth of 100'. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** Total depth of well

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $10,760.19

**Scenario Cost/Unit:** $107.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 18 | $6,411.06 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 18 | $579.96 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 0.7 | $535.65 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 10 in. | 1788 | Well cap, 10 inch. Materials only. | Each | $110.22 | 1 | $110.22 |
| Well Casing, Plastic, 10 in. | 1806 | PVC or ABS non-threaded well casing, 10 inch. Materials only. | Feet | $26.93 | 70 | $1,885.10 |
| Well Screen, plastic, 8 in. | 2000 | 8 inch PVC well screen. Materials only. | Feet | $31.00 | 30 | $930.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #62 - 8 inch well cased, PVC, Shallow well

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. An average well depth is 100 feet. Well casings are 8" in diameter. Well is typically cased 70% of the depth and the remaining 30% is screened.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in irrigation.

**After Situation:**

Install a 100' deep well with 70' of 8" PVC and 30' of well screening. Casing grouted to seal out surface water. Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** Total depth of well

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $9,368.99

**Scenario Cost/Unit:** $93.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 16 | $5,698.72 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 16 | $796.96 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 0.5 | $382.61 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 8 in. | 1787 | Well cap, 8 inch. Materials only. | Each | $82.10 | 1 | $82.10 |
| Well Casing, Plastic, 8 in. | 1805 | PVC or ABS non-threaded well casing, 8 inch. Materials only. | Feet | $16.72 | 70 | $1,170.40 |
| Well Screen, plastic, 8 in. | 2000 | 8 inch PVC well screen. Materials only. | Feet | $31.00 | 30 | $930.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #96 - Dug Well

**Scenario Description:**

Typical construction is for the excavation of a shallow dug well. The purpose of the practice is to provide water for livestock. A typical dug well is 4 foot in diameter and 15 feet in depth. The well is excavated using a backhoe. Excavate to a depth where the water recharge is greater than the equipment can remove. Washed gravel is placed in the base of the dug opening. Concrete manhole risers are installed to hold the water. Pea gravel is placed above the washed gravel to transition to the earth backfill. The hole is backfilled and sloped to direct surface water away from entering the manhole cover.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source.

**After Situation:**

Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $14,605.28

**Scenario Cost/Unit:** $14,605.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 10 | $532.10 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 11 | $547.91 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 3 | $93.45 |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Manhole, 4 ft x 4 ft | 1053 | Precast Manhole with base and top delivered. 4 feet diameter x 4 feet. Includes materials only. | Each | $1,476.74 | 5 | $7,383.70 |
| Aggregate, gravel, washed, pea gravel | 1331 | Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $34.53 | 1 | $34.53 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 7 | $5,356.47 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 5 | $33.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #97 - Shallow Well

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. An average well depth is 75 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 50 feet.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

**After Situation:**

Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $10,219.91

**Scenario Cost/Unit:** $10,219.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 10 | $3,561.70 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 2 | $1,530.42 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $52.34 | 1 | $52.34 |
| Well Casing, Metal, 6 in. | 1810 | Steel well casing, 6 inch. Materials only. | Feet | $33.74 | 50 | $1,687.00 |
| Well Screen, stainless steel, 6 in. | 1995 | 6 inch Stainless steel well screen. Materials only. | Feet | $123.21 | 25 | $3,080.25 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #98 - Typical Well

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 300 feet.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

**After Situation:**

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $38,758.85

**Scenario Cost/Unit:** $38,758.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 40.5 | $14,424.89 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 2 | $1,530.42 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $52.34 | 1 | $52.34 |
| Well Casing, Metal, 6 in. | 1810 | Steel well casing, 6 inch. Materials only. | Feet | $33.74 | 300 | $10,122.00 |
| Well Screen, stainless steel, 6 in. | 1995 | 6 inch Stainless steel well screen. Materials only. | Feet | $123.21 | 100 | $12,321.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #99 - Deep Well

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur > 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 800 feet. Well casings are 4-6" in diameter. Steel casing is installed to a depth of 600 feet.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

**After Situation:**

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $71,886.95

**Scenario Cost/Unit:** $71,886.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 70.5 | $25,109.99 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 2 | $1,530.42 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $52.34 | 1 | $52.34 |
| Well Casing, Metal, 6 in. | 1810 | Steel well casing, 6 inch. Materials only. | Feet | $33.74 | 600 | $20,244.00 |
| Well Screen, stainless steel, 6 in. | 1995 | 6 inch Stainless steel well screen. Materials only. | Feet | $123.21 | 200 | $24,642.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #100 - High Volume Shallow Well

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for overhead irrigation. An average well depth is 75 feet. Well casings are = 8" in diameter. Steel casing is installed to a depth of 50 feet.

**Before Situation:**

There is insufficient water for use in irrigation.

**After Situation:**

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $18,496.38

**Scenario Cost/Unit:** $18,496.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 10.5 | $3,739.79 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 2 | $1,530.42 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 10 in. | 1788 | Well cap, 10 inch. Materials only. | Each | $110.22 | 1 | $110.22 |
| Well Casing, Metal, 10 in. | 1812 | Steel well casing, 10 inch. Materials only. | Feet | $68.95 | 50 | $3,447.50 |
| Well Screen, stainless steel, 10 in. | 1996 | 10 inch Stainless steel well screen. Materials only. | Feet | $374.41 | 25 | $9,360.25 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #101 - High Volume Typical Well

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are = 8" in diameter. Steel casing is installed to a depth of 300 feet.

**Before Situation:**

There is insufficient water for use in irrigation.

**After Situation:**

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $74,499.73

**Scenario Cost/Unit:** $74,499.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 40.5 | $14,424.89 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 2 | $1,530.42 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 10 in. | 1788 | Well cap, 10 inch. Materials only. | Each | $110.22 | 1 | $110.22 |
| Well Casing, Metal, 10 in. | 1812 | Steel well casing, 10 inch. Materials only. | Feet | $68.95 | 300 | $20,685.00 |
| Well Screen, stainless steel, 10 in. | 1996 | 10 inch Stainless steel well screen. Materials only. | Feet | $374.41 | 100 | $37,441.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #122 - High Volume Deep Well

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur > 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are = 8" in diameter. Steel casing is installed to a depth of 600 feet.

**Before Situation:**

There is insufficient water for use in irrigation.

**After Situation:**

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

**Feature Measure:** No.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $143,310.83

**Scenario Cost/Unit:** $143,310.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 70.5 | $25,109.99 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 2 | $1,530.42 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 10 in. | 1788 | Well cap, 10 inch. Materials only. | Each | $110.22 | 1 | $110.22 |
| Well Casing, Metal, 10 in. | 1812 | Steel well casing, 10 inch. Materials only. | Feet | $68.95 | 600 | $41,370.00 |
| Well Screen, stainless steel, 10 in. | 1996 | 10 inch Stainless steel well screen. Materials only. | Feet | $374.41 | 200 | $74,882.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 642 - Water Well

**Scenario** #123 - Steel or Copper, 100 ft. or deeper

**Scenario Description:**

Typical construction is for the installation of a well, in areas where sufficient water is known to occur greater than 2000 feet from the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 2500 feet. Plastic Surface casings are 6 in diameter with smaller diameter casing and screen extending into the water bearing formation. Steel casing and screen is installed to a typical depth of 2500 feet.

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

**After Situation:**

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

**Feature Measure:** Depth of Well

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $163,725.62

**Scenario Cost/Unit:** $81.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Rotary Drill Rig | 1595 | Rotary drill rig including equipment and power unit costs. Labor not included. | Hours | $356.17 | 120 | $42,740.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 200 | $6,444.00 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 1 | $50.05 |
| Grout, cement | 1333 | Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place. | Cubic Yards | $765.21 | 1 | $765.21 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallons | $6.68 | 1 | $6.68 |
| Well Cap, 6 in. | 1786 | Well cap, 6 inch. Materials only. | Each | $52.34 | 1 | $52.34 |
| Well Casing, Stainless Steel/Copper, 2 in. | 1796 | Stainless steel or Copper well casing, 2 inch. Materials only. | Feet | $52.66 | 2000 | $105,320.00 |
| Well Casing, Plastic, 6 in. | 1804 | PVC or ABS non-threaded well casing, 6 inch. Materials only. | Feet | $11.00 | 500 | $5,500.00 |
| Well Screen, stainless steel, 2 in. | 2278 | 2 inch Stainless steel well screen. Materials only. | Feet | $46.88 | 50 | $2,344.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #1 - Habitat Monitoring and Management, Very-Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types were the native plant condition (i.e. T&E plant species) or wildlife habitat is the resource concern, and where very-low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 16 hours of labor per year.

**Before Situation:**

Rare or declining habitat is deficient and annual monitoring and adaptive management actions of very-low intensity and complexity will improved conditions.

**After Situation:**

Rare and declining habitat is improved by implementation of annual adaptive management actions of very- low intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 640.00

**Scenario Total Cost:** $857.11

**Scenario Cost/Unit:** $1.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #2 - Habitat Monitoring and Management, Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where native plant conditions (T&E plants) or wildlife have been identified as the resource concern, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

**Before Situation:**

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

**After Situation:**

Rare and declining habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $716.75

**Scenario Cost/Unit:** $4.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1 | $6.65 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1.5 | $37.05 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 7 | $225.54 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #3 - Rare or Declining Habitat Monitoring and Management, Medium Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified related to rare or declining habitats, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that impede monitoring efforts, replacing damaged fence markers, or other minor adaptive management activities). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

**Before Situation:**

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

**After Situation:**

Rare or declining habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $2,515.87

**Scenario Cost/Unit:** $15.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 4 | $26.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 5 | $153.10 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #4 - Habitat Monitoring and Management, High Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

**After Situation:**

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $2,413.19

**Scenario Cost/Unit:** $30.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8 | $53.20 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 3 | $91.86 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

**Scenario Description:**

This typical scenario is installed on open non-wetlands. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available for invertebrate use.

**After Situation:**

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** hours of tractor use

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $986.70

**Scenario Cost/Unit:** $49.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 6 | $379.98 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

**Scenario Description:**

This typical scenario is installed on open non-wetlands, where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking diversity.

**After Situation:**

Deep (6" - 12" depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** Hours

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $2,391.27

**Scenario Cost/Unit:** $119.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 6 | $1,110.06 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #7 - Oyster Bar Purchase and place 2 inch

**Scenario Description:**

Restore oyster bar by placing shell on the bottom to create a 2-inch thick shell base. Oyster bar seeded with at least 1M spat on cultch.

**Before Situation:**

Bay or tidal river bottom where conditions are appropriate for oyster growth and survival, but lacking shell and oyster production. The resource concern is lack of habitat associated with oyster bars and oyster reproduction. The lack of living oyster bars negatively effects water quality because oysters can remove significant quantities of nutrients and suspended sediments.

**After Situation:**

One acre of osyter bar is  restored. The bar consist of 2 acre-inches of shell bed. The restored oyster bar supports oyster growth and reproduction, and provides habitat for many other aquatic species. The living oysters will remove significant quantities of nutrients and suspended sediments, thereby enhancing water quality. These bars are maintained by oyster farmers to ensure survival of the bar.

**Feature Measure:** Area of restored habitat

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $29,482.06

**Scenario Cost/Unit:** $29,482.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs.  Labor not included. | Hours | $94.51 | 4 | $378.04 |
| Barge with crane and operator | 2408 | Barge to transport and place 1 ton bags of cultch to form oyster reef habitat. | Hours | $346.88 | 8 | $2,775.04 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training.  Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities.  Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Cultch | 2409 | Cultch material (used and/or slightly crushed, cleaned, medium to large sized shells).  Includes materials only. | Ton | $80.81 | 110 | $8,889.10 |
| Spat on Shell | 2578 | Aged bagged shells with spat for Oyster Reef Restoration.  Includes materials and shipping from hatchery to dockside. | Bushel | $53.61 | 300 | $16,083.00 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #8 - Oyster Bar Purchase and place 4 inch

**Scenario Description:**

Restore oyster bar by placing shell on the bottom to create a 4-inch thick shell base. Oyster bar seeded with at least 1M spat on cultch.

**Before Situation:**

Bay or tidal river bottom where conditions are appropriate for oyster growth and survival, but lacking shell and oyster production. The resource concern is lack of habitat associated with oyster bars and oyster reproduction. The lack of living oyster bars negatively effects water quality because oysters can remove significant quantities of nutrients and suspended sediments.

**After Situation:**

One acre of osyter bar is  restored. The bar consist of 4 acre-inches of shell bed. The restored oyster bar supports oyster growth and reproduction, and provides habitat for many other aquatic species. The living oysters will remove significant quantities of nutrients and suspended sediments, thereby enhancing water quality. These bars are maintained by oyster farmers to ensure survival of the bar.

**Feature Measure:** Area of restored habitat

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $42,538.20

**Scenario Cost/Unit:** $42,538.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs.  Labor not included. | Hours | $94.51 | 8 | $756.08 |
| Barge with crane and operator | 2408 | Barge to transport and place 1 ton bags of cultch to form oyster reef habitat. | Hours | $346.88 | 16 | $5,550.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training.  Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 28 | $902.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities.  Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Cultch | 2409 | Cultch material (used and/or slightly crushed, cleaned, medium to large sized shells).  Includes materials only. | Ton | $80.81 | 220 | $17,778.20 |
| Spat on Shell | 2578 | Aged bagged shells with spat for Oyster Reef Restoration.  Includes materials and shipping from hatchery to dockside. | Bushel | $53.61 | 300 | $16,083.00 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #15 - Oyster Bar - Bagged Dredging

**Scenario Description:**

Restore oyster bar by bag-dredging and placing shell on bottom to create a minimum 2-inch thick shell base and then seed the shell base with oyster spat set on cultch (large pieces of shell). Bed will be seeded with at least 1 million spat on cultch. The restored oyster bar will provide habitat for fish and other aquatic organisms.

**Before Situation:**

Bay or tidal river bottom where conditions are appropriate for oyster growth and survival, but with insufficient shell on bottom and oyster production. The site has a significant source of buried shell that can be dredged to provide all of the shell needed for the base. The resource concern is lack of habitat associated with oyster bars and oyster reproduction.

**After Situation:**

One acre of oyster bar will be restored. The bar will consist of a minimum 2-inch thick shell bed and at least 1 million oyster spat on cultch. The restored oyster bar will support oyster growth and reproduction, and provide habitat for many other aquatic species. The living oysters will remove significant quantities of nutrients and sediments, thereby enhancing water quality. These bars will be maintained by oyster farmers to ensure survival of the bar, and will be harvested and replenished to maintain healthy functioning.

**Feature Measure:** Acres created/restored

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $22,430.88

**Scenario Cost/Unit:** $22,430.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Boat, 150 HP | 2407 | 22 foot boat with 150hp motor used to place cultch to create reef habitat. | Hours | $202.81 | 22 | $4,461.82 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 22 | $708.84 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 22 | $1,177.22 |
| **Materials** | | | | | | |
| Spat on Shell | 2578 | Aged bagged shells with spat for Oyster Reef Restoration. Includes materials and shipping from hatchery to dockside. | Bushel | $53.61 | 300 | $16,083.00 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #17 - Oyster Rack Spacing for Wildlife Movement

**Scenario Description:**

Rebar, mounted in place oyster racks are built and installed to the appropriate height and spacing to allow for wildlife (i.e. Horseshoe crabs) movement underneath and around the racks. Rack height is at least 12 inches. Rack length is 120 inches by 30 inch width. Typical installation is 50 racks.

**Before Situation:**

Wildlife movement is inhibited by the oyster production racks. Wildlife may be trapped beneath the racks in the tide and unable to reach nesting habitat on shore.

**After Situation:**

Oyster racks are disposed and new racks built at the appropriate height to facilitate wildlife movement around and underneath racks.

**Feature Measure:** Oyster Rack

**Scenario Unit:** Each

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $3,997.06

**Scenario Cost/Unit:** $79.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 50 | $1,611.00 |
| **Materials** | | | | | | |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 2881 | $2,247.18 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #42 - Wetland Plug Planting

**Scenario Description:**

Area is to be established to wetland plants that support declining, rare, threatened or endangered plant or animal habitat, including pollinators and beneficial insects. Patches that are each approximately 2,200 square feet are planted on 18 to 24 inch spacing to provide desirable plant composition and structure and habitat for associated wildlife species. Planted patches will provide source for eventual colonization and expansion into other areas of the wetland.

**Before Situation:**

Area recently restored to wetland hydrology or where invasive or undesirable species were controlled lacks adequate seed bank or wetland vegetation to support declining, rare, threatened or endangered species habitat. Seed bank is limited in species diversity and will not provide plant diversity necessary to meet full ecological functions.

**After Situation:**

Wetland plants that support declining, rare, threatened or endangered species are established in patches within a wetland or wetland complex. The planted patches provide vegetative diversity that would not occur if vegetation came only from the existing seedbank. The established plants will provide source for expansion into other portions of the wetland.

**Feature Measure:** Area to be planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.05

**Scenario Total Cost:** $988.49

**Scenario Cost/Unit:** $19,769.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| **Materials** | | | | | | |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $0.99 | 711 | $703.89 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #46 - Marsh Ditch Fill

**Scenario Description:**

Typical setting is a tidal marsh or very wet marsh where access is difficult due to high water table and saturated soils. Ditches were excavated in the marsh to lower the water table, provide outlets for drainage of adjacent lands, or ostensibly to provide mosquito control. The ditch provides a direct conduit for surface runoff from upland ag areas to surface waters, decreases the wetland hydroperiod, and/or allows for saltwater or brackish water intrusion into previously brackish or fresh water marshes. The ditch will be filled with appropriate material up to the current marsh surface. Material will be hauled to a landing site, and a low psi excavator will haul material to ditch and fill it in. Construction mats will be used on marsh to prevent permanent damage to vegetation and soils.

**Before Situation:**

Ditch in marsh area where lowers surface water profile, significantly affecting hydrology, and allowing for direct discharge of pollutants into waterways. The ditch may facilitate saltwater intrusion into previously brackish or fresh water marsh areas, which resulted in a change in the natural vegetation community. A lower water table has resulted in in shorter hydroperiods, reducing the aquatic macroinvertebrate populations that provide food for fish and waterfowl, and causing a loss of organic matter. Resource Concerns: Fish and Wildlife Habitat - Inadequate Habitat - Habitat Degradation, Degraded Plant Condition - Inadequate Structure and Composition

**After Situation:**

Ditch is filled up to marsh surface. Freshwater flows from adjacent land can spread out on the marsh surface, and tides do not reach nontidal edge as frequently. Groundwater and/or surface water profile in and adjacent to filled ditch is returned to natural levels. Structure allows for outflows when water level is higher than design water surface. In saltwater/brackish areas, reduced inflows of salt or brackish water into marsh facilitates a fresh water to saltwater gradient, which increases vegetative diversity. Associated Practices: Structure for Water Control (587), Wetland Wildlife Habitat Management (649), Mulching (484), Critical Area Seeding (342)

**Feature Measure:** Length of ditch fill

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $16,417.26

**Scenario Cost/Unit:** $32.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 26 | $3,252.86 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 5 | $526.40 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 31 | $1,544.11 |
| **Materials** | | | | | | |
| Wood Construction Mat | 2657 | Wood Construction Mat weekly rental rate per Square Foot of mat. Material Only. Used for access and/or work pad in remote sensitive areas. | Square Feet | $1.27 | 6000 | $7,620.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 5 | $2,400.65 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #60 - Oyster Reef Barge Crane

**Scenario Description:**

Restoration of native oyster beds by placing oyster shells to form beds in coastal estuaries and bays. Typically requires approximately 100 tons of oyster or clam shells placed on the bottom of the coastal estuary. The shell is transported to site by barge. Transportation and placement of the shell usually takes one day. The shell is typically dried over winter to remove disease and then placed on the bottom of estuary. Shell creates habitat for both oysters and other native wildlife.

**Before Situation:**

Coastal estuaries and bays are lacking beneficial oyster beds. Oyster beds have been degraded or eliminated due to poor water quality, weather events or disease. A lack of or decrease in oyster beds limits wildlife and overall water quality is decreased. Oysters will filter the water and improve water quality.

**After Situation:**

Oyster beds are restored, water quality is improved and wildlife habitat is improved.

**Feature Measure:** Area of restored habitat

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,312.36

**Scenario Cost/Unit:** $12,312.36

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 8 | $756.08 |
| Barge with crane and operator | 2408 | Barge to transport and place 1 ton bags of cultch to form oyster reef habitat. | Hours | $346.88 | 8 | $2,775.04 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Cultch | 2409 | Cultch material (used and/or slightly crushed, cleaned, medium to large sized shells). Includes materials only. | Ton | $80.81 | 100 | $8,081.00 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #61 - Oyster Bar Purchase and Place 2 inch, No Spat on Cultch

**Scenario Description:**

Restore oyster bar by placing shell on the bottom to create a 2-inch thick shell base. Bar is not seeded with spat on cultch because the area in which the bar is created has sufficient natural reproduction for oysters to establish without seeding. Resource concern: Aquatic habitat for fish and other organisms.

**Before Situation:**

Bay or tidal river bottom where conditions are appropriate for oyster growth and survival, but lacking shell and oyster production. The resource concern is lack of habitat associated with oyster bars and oyster reproduction. The lack of living oyster bars negatively effects water quality because oysters can remove significant quantities of nutrients and suspended sediments.

**After Situation:**

One acre of oyster bar is restored. The bar consist of 2 acre-inches of shell bed. The restored oyster bar supports oyster growth and reproduction, and provides habitat for many other aquatic species. The living oysters will remove significant quantities of nutrients and suspended sediments, thereby enhancing water quality. These bars are maintained by oyster farmers to ensure survival of the bar.

**Feature Measure:** Area of restored habitat

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $13,056.14

**Scenario Cost/Unit:** $13,056.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hours | $94.51 | 4 | $378.04 |
| Barge with crane and operator | 2408 | Barge to transport and place 1 ton bags of cultch to form oyster reef habitat. | Hours | $346.88 | 8 | $2,775.04 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Cultch | 2409 | Cultch material (used and/or slightly crushed, cleaned, medium to large sized shells). Includes materials only. | Ton | $80.81 | 110 | $8,889.10 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #76 - Reef Creation-Live Oysters and Cultch

**Scenario Description:**

Spat on Shell: 1 million oyster larvae are grown in an aquaculture facility on shell which are then placed on top of shell to improve the amount of living animals in order to improve regeneration of the developed or restored reef. Each setting will require 45 fish totes (0.11 cubic yards per tote). Shell will be placed in bags and transported to the aquaculture facility. Approximately 1 million larvae are added to the tank and they set on the shells. The oysters are set in the tanks for 7-10 days. The bags are then place in the coastal ponds or estuaries until oysters grow to greater than or equal to 1 '.. The oysters are placed on beds created from clean shell (45 totes 5 yards of clean shell average of 2'). The following process is used: 1. Collect shell for bagging-2 people for 2 days, 300 bags. (16 hours) 2. Spat on Shell includes setting, and transportation. ARC sets oysters goal is to plant ?? million at 1 inch or greater. In tank for 7-10 days. 3 . Go back and pick up oysters. 1 day trucking 2 persons. Then bring out to area to grow out. 4 hours boat time plus 3 workers. 4. Oysters are grown out over June-October, normally 8 hours per week, 2 people. Boat time would be approximately 4 hours per week. 5. Place cultch on bottom. 5 yards or 3.5 tons of cultch (45 totes). 9 totes in a yard. 8 hours with boat, 4 laborers(32 hours) ( 3.5 tons of cultch are used to build the reef base prior to deployment of live oysters. 6 . Oysters placed on cultch. 8 hours with boat, 4 laborers(32 hours) 7 . Additional gear to grow out. Additional grow out bags 500-600. $5.50 per bag, each cage holds 5-6 bags, $12,000. 3 years is $4,000 per year. 8. Oyster shell, $1,500 per 300 bags. Scenario is based on 90 fish totes.

**Before Situation:**

Coastal estuaries and coastal ponds are lacking beneficial oyster beds. The oyster beds have been degraded or eliminated due to poor water quality, weather events, or disease. Beds have limited population of oysters or lack any oysters. This limits the natural regeneration of the beds. The lack of or decrease in oyster beds limits wildlife food and cover. Water quality is decrease due to a lack of filtering by the oysters.

**After Situation:**

The biological and structural components of the oyster beds are restored. These populated oysters can continue to re-seed the bed, as well as, surrounding beds. Native wildlife habitat is increased. There is an increase in both food and cover for native wildlife. Oysters that set on the beds provide increased water quality by additional filtering of the water.

**Feature Measure:** Totes

**Scenario Unit:** Each

**Scenario Typical Size:** 90.00

**Scenario Total Cost:** $53,250.87

**Scenario Cost/Unit:** $591.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Boat, 150 HP | 2407 | 22 foot boat with 150hp motor used to place cultch to create reef habitat. | Hours | $202.81 | 96 | $19,469.76 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 220 | $7,088.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 48 | $6,349.44 |
| **Materials** | | | | | | |
| Cultch | 2409 | Cultch material (used and/or slightly crushed, cleaned, medium to large sized shells). Includes materials only. | Ton | $80.81 | 7 | $565.67 |
| Hatchery Seed Oysters | 2635 | Hatchery produced oyster seed with spat grown to 1 to 2 inch for Oyster Reef Restoration. Unit is per 1,000 count. Includes materials and shipping from hatchery to dockside. | Each | $19.58 | 1000 | $19,580.00 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #98 - Beaver Dam Analogues or Post-Assisted Log Structures

**Scenario Description:**

This scenario includes installation of low-tech woody structures (Beaver Dam Analogues (BDAs) or Post-Assisted Log Structures (PALS)) to facilitate process-based restoration in perennial, intermittent, or ephemeral streams and riparian areas. These simple structures are low, semi-permeable, and hand-built using native materials (wood, sod, etc.). Untreated wooden fence posts are added where necessary for extra stability. Structures are designed to be short-lived and used primarily as a temporary tool to promote natural process recovery. Structures mimic the function of natural beaver dams and wood accumulation in streams by reducing water velocities, raising water tables, enhancing floodplain connectivity, and inducing other dynamic ecological and hydrogeomorphic processes. Typically, complexes consisting of multiple structures within a reach are used to meet project objectives. Structures can be used on all land uses to address a variety of resource concerns and are strategically placed to meet specific purposes, such as, mesic and wetland vegetation expansion, floodplain development in incised channels, increased habitat complexity for fish and wildlife, and beaver re-establishment. Associated practices include: 528, 391, 644, 612, 382. Typical scenario includes 20 structures averaging 20 ft length each (total = 400 lin ft of structures). Crew of one biologist, one crew manager, and three laborers (one skilled).

**Before Situation:**

Degraded stream channel and associated riparian/mesic/wetland vegetation are impaired by lack of structural complexity, channel incision, reduced floodplain connectivity, or inadeqaute habitat features. Extent of potential riparian/mesic/wetland vegetation is reduced due to lack of floodplain inundation or low water table. Channel condition/complexity is insufficient to permit proper hydrologic function, vegetation maintenance/recovery, or to support desired fish and wildlife habitat.

**After Situation:**

Low-tech structures mimic and promote ecological and physical processes that foster recovery of streams, riparian areas, wet meadows, or aquatic ecosystems. Channel complexity is increased and condition improved by promoting riparian/mesic/wetland vegetation expansion, reconnecting floodplains, and increasing habitat structure for fish and wildlife. Additional treatments may be needed through time until ecosystem is self-sustaining.

**Feature Measure:** Linear Feet

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 400.00

**Scenario Total Cost:** $20,580.58

**Scenario Cost/Unit:** $51.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 24 | $159.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 12 | $296.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 18 | $333.90 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 48 | $614.88 |
| Portable Post Driver | 2722 | Gas or Hydraulic Powered Post Driver, Portable, <300 lbs, labor not included | Hours | $18.03 | 48 | $865.44 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 72 | $3,683.52 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 60 | $3,210.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 30 | $3,968.40 |
| **Materials** | | | | | | |
| Post, Wood, Untreated, 3-4 in. x 7 ft. | 2721 | Round Post, Wood, Untreated, 3-4 inch diameter x 7 feet | Each | $8.78 | 400 | $3,512.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 643 - Restoration of Rare or Declining Natural Communities

**Scenario** #99 - Very small acres planting with seedlings or plugs

**Scenario Description:**

A resource concern has identified the need to re-establish, by planting of live plants (seedlings or plugs) to restore the site to the natural rare or declining plant community or community of local cultural importance. This practice scenario applies to areas not recently in crop production, including fallow cropland currently supporting native or non-native vegetation needing control prior to planting. The restoration effort will consist of planting a rich and diverse mix of species native to the area and representative of the historic plant community. Light site preparation will occur prior to planting via herbicide burndown followed by burning, mowing or disking. If the plant community supported difficult to control species; those species were treated previous to the planting via the implementation of CPS Brush Management (Code 314) and/or Herbaceous Weed Control (Code 315).

**Before Situation:**

The site supports a common plant community (not rare or declining) in the region and does not require aggressive techniques for control and the site is suitable for the implementation of Restoration on Rare or Declining Habitats (CPS Code 643).

**After Situation:**

Desired species have been established by planting seedlings or plugs, restoring the identified rare and declining community, or community of local cultural importance.

**Feature Measure:** acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,259.53

**Scenario Cost/Unit:** $3,259.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 2 | $26.42 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Tree & Shrub, Specialty | 1523 | Locally-sourced, culturally significant, native, or other highly specialized trees and shrubs (e.g., American chestnut, American elm, Canada yew, Sagebrush). Potted or balled and burlapped tree or shrub, 5 gallon. Includes materials and shipping only. | Each | $12.50 | 200 | $2,500.00 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #1 - Habitat Monitoring and Management, Very-Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to wetlands within all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where very-low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 16 hours of labor per year.

**Before Situation:**

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of very-low intensity and complexity.

**After Situation:**

Wetland wildlife habitat is improved by implementation of annual adaptive management actions of very- low intensity and complexity.

**Feature Measure:** Area of Monitoring efforts and ada

**Scenario Unit:** Acres

**Scenario Typical Size:** 640.00

**Scenario Total Cost:** $857.11

**Scenario Cost/Unit:** $1.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #2 - Wetland Wildlife Habitat Monitoring and Management, Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to wetlands on landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

**Before Situation:**

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

**After Situation:**

Widlife habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

**Feature Measure:** Area of Monitoring efforts and ada

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $716.75

**Scenario Cost/Unit:** $4.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1 | $6.65 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1.5 | $37.05 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 7 | $225.54 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #3 - Habitat Monitoring and Management, Medium Intensity and Complexity

**Scenario Description:**

This scenario is applied to wetland areas located on all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

**Before Situation:**

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

**After Situation:**

wetland wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

**Feature Measure:** Area of Monitoring efforts and ada

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $2,515.87

**Scenario Cost/Unit:** $15.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 4 | $26.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 5 | $153.10 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #4 - Habitat Monitoring and Management, High Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

**After Situation:**

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

**Feature Measure:** Area of Monitoring efforts and ada

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $3,112.87

**Scenario Cost/Unit:** $38.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 4 | $500.44 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8 | $53.20 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 3 | $91.86 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

**Scenario Description:**

This typical scenario is installed on non-forested wetlands, including openlands prior to tree planting. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available for invertebrate use.

**After Situation:**

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** Area of topographic feature

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $986.70

**Scenario Cost/Unit:** $49.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 6 | $379.98 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

**Scenario Description:**

This typical scenario is installed on non-forested wetlands (or open land prior to tree planting), where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking diversity.

**After Situation:**

Deep (6" - 12" depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** Area of topographic feature

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $2,391.27

**Scenario Cost/Unit:** $119.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 6 | $1,110.06 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #17 - Establishment of seasonal wildlife forage or cover on non-cropland

**Scenario Description:**

The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual plants by planting of seed. The typical scenario will occur on areas supporting perennial herbaceous vegetation, not currently in cropland. Due to existing dense vegetation, these area will need to be mowed 2-3 weeks prior to disking (primarily disking), then followed by a light disking. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. Mixed fertilizer is required to establish planted wildlife forage. A seed mix consisting of annuals is typical for this activity.

**Before Situation:**

The existing habitat has an excess of herbaceous perennial habitat suitable for cover, but is lacking high quality forage seasonal forage, or the cover conditions is too thick and establishment of annuals create a diverse cover condition for the target wildlife species.

**After Situation:**

The availability of high-quality seasonal forage for the target wildlife species is provided and target wildlife health is improved, and populations are increased.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,443.36

**Scenario Cost/Unit:** $144.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 3 | $91.86 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 20 | $264.20 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 10 | $201.30 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 10 | $572.40 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #18 - Establishment of annuals for wildlife on cropland, with FI

**Scenario Description:**

The habitat assessment identified the need to provide seasonal forage or cover for target wildlife species or guild. This identified habitat need will be met through the establishment of annual vegetation by planting of seed. This typical scenario is that this activity will occur on cropland, but outside of the normal cropping season. Thus, income will not be foregone. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient.

**Before Situation:**

Cropland that fails to provide adequate wildlife habitat (forage and/or cover) seasonally for the target wildlife species..

**After Situation:**

The availability of high-quality seasonal forage for the target wildlife species is provided and target wildlife health and populations are increased.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,578.80

**Scenario Cost/Unit:** $457.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 10 | $3,560.70 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 10 | $572.40 |

**Practice:** 644 - Wetland Wildlife Habitat Management

**Scenario** #19 - Establishment of annual vegetation on cropland, without FI

**Scenario Description:**

The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild, outside of the cropping season. This habitat deficiency will be met through the establishment of annual vegetation by planting of seed following harvest. The typical scenario is that this activity will occur on cropland. Seed bed preparation will be light disking followed by firming the seed bed by cultipacking. Mixed fertilizer is required to establish planted wildlife forage.

**Before Situation:**

The existing habitat is cropland, lacking high quality forage seasonal forage or the cover conditions created by the planting of annual vegetative species outside of the cropping season.

**After Situation:**

The area is cropped to a cash-crop and then during the non-crop season, wildlife habitat is enhanced by planting high-quality seasonal forage for seasonal cover. Target wildlife individual's health and populations are increased.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,018.10

**Scenario Cost/Unit:** $101.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 10 | $572.40 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #1 - Habitat Monitoring and Management, Very-Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where very-low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 16 hours of labor per year.

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of very-low intensity and complexity.

**After Situation:**

Widlife habitat is improved by implementation of annual adaptive management actions of very- low intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 640.00

**Scenario Total Cost:** $857.11

**Scenario Cost/Unit:** $1.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #2 - Habitat Monitoring and Management, Low Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nest boxs, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 8 hours labor per year.

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

**After Situation:**

Widlife habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $716.75

**Scenario Cost/Unit:** $4.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1 | $6.65 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1.5 | $37.05 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 7 | $225.54 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #3 - Habitat Monitoring and Management, Medium Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

**After Situation:**

Wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $2,515.87

**Scenario Cost/Unit:** $15.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 4 | $26.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 5 | $153.10 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #4 - Habitat Monitoring and Management, High Intensity and Complexity

**Scenario Description:**

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per

**Before Situation:**

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

**After Situation:**

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

**Feature Measure:** Monitoring efforts and adaptive m

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $3,112.87

**Scenario Cost/Unit:** $38.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 4 | $500.44 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8 | $53.20 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 3 | $91.86 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.

**Scenario Description:**

This typical scenario is installed on open non-wetlands. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario it typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available for invertebrate use.

**After Situation:**

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** hours of tractor use

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $986.70

**Scenario Cost/Unit:** $49.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 6 | $379.98 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.

**Scenario Description:**

This typical scenario is installed on open non-wetlands, where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario it typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking diversity.

**After Situation:**

Deep (6" - 12" depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Feature Measure:** Hours

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $2,391.27

**Scenario Cost/Unit:** $119.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 200 HP | 928 | Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included. | Hours | $185.01 | 6 | $1,110.06 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #7 - Interrupted Hay Harvest for Grassland Birds

**Scenario Description:**

This practice involves a change in the mowing regime on productive hayland by ensuring an early hay cut in mid to late May followed by a delay in the second cut of 65 days. A third cut is allowed. Research has shown that implementing this management on intensely managed hayfields will provide nearly the same productivity for grassland songbirds as a hayfield not mowed until August 1st. Facilitating practice includes 315 Herbaceous Weed Control. Resource concerns include Wildlife: food and cover.

**Before Situation:**

Typical setting for this practice is agricultural dominated landscapes with large fields. These agricultural landscapes, and other large grass areas such as airports or preserves, are often the most desirable areas for grassland birds in the Northeast. Breeding success for grassland songbirds on intensively managed hayfields (3-4 cuts per summer) is nearly non-existent as the time period between mowings is too short for successful nesting. Through mowing the nests are destroyed or cover is removed making them vulnerable to predation by crows, ring-billed gulls and other predators. The reduction in nesting sites reduces the population of grassland nesting birds.

**After Situation:**

Fields are a minimum of 20 acres of uninterrupted grassland with a low perimeter-to-area ratio (approx. square). First cut and all associated management including raking, bailing and manure spreading are completed by May 31st. The sequence of cutting and field management practices is allowed after 65 days. Habitat for grassland bird nesting is improved, reducing egg and nestling mortality. Nest survival and fledging rates are increased.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $2,586.44

**Scenario Cost/Unit:** $129.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $50.94 | 30 | $1,528.20 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #278 - Establishment of seasonal wildlife forage or cover on cropland, no FI

**Scenario Description:**

This typical scenario occurs on cropland. The habitat assessment identifed the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual food plants or cover plants by planting of seed. The typical scenario for seasonal forage or cover will be established outside of crop season, thus FI is not needed. Seedbed preparation (light tilliage) will be furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient. Cropland, so mobilization of equipment not needed.

**Before Situation:**

Cropland that fails to provided food or cover for target species at the proper location and season to meet the needs of wildlife.

**After Situation:**

The availability of high-quality seasonal forage or seasonal cover for the target wildlife species is provided. Target wildlife health is improved and populations are increased.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $2,050.70

**Scenario Cost/Unit:** $205.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Sulfate | 70 | Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.60 | 600 | $960.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 10 | $572.40 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #279 - Establishment of seasonal forage or cover for wildlife on cropland, with FI

**Scenario Description:**

The habitat assessment identified the need to provide seasonal forage or cover for target wildlife species or guild. This habitat needs will be met through the establishment of annuals by planting of seed. The typical scenario is for cropland. Seed bed preparation is limited to one light disking, furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient. These wildlife forages or seasonal cover will be be available for wildlife during the cropping seasion, and are in lieu of the cash crops typically planted on the field. Thus, income from the cash crop will be foregone for a year.

**Before Situation:**

Cropland does not provide forage or cover needed for wildlife during the season on dearth.

**After Situation:**

Annual wildlife forages are planted in lieu of a cash crop. Target wildlife health is improved and populations are increased.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $5,271.40

**Scenario Cost/Unit:** $527.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 5 | $1,780.35 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 5 | $1,531.25 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Sulfate | 70 | Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.60 | 600 | $960.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 10 | $572.40 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #280 - Establishment of seasonal forage or cover for wildlife on non-cropland.

**Scenario Description:**

The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual plants by planting of seed. The typical scenario is that this activity will occur on herbaceous areas, not currently in cropland. Due to existing dense vegetation, these area will need to be mowed 2-3 weeks prior to disking (primarily disking), then followed by a light disking. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. Mixed fertilizer is required to establish planted wildlife seasonal forage or seasonal cover..

**Before Situation:**

The existing habitat has an excess of herbaceous perineal habitat, but is lacking high-quality seasonal forage, or the existing cover is too dense and cover conditions found in annual plant communities are absent.

**After Situation:**

The availability of high-quality seasonal forage, or cover condition common in annual plant communities is provided and target wildlife health and populations are increased.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,075.96

**Scenario Cost/Unit:** $407.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 3 | $91.86 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 20 | $264.20 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 10 | $201.30 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 10 | $90.90 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Sulfate | 70 | Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.60 | 1000 | $1,600.00 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 600 | $606.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 600 | $354.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 10 | $572.40 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #281 - Fallow Field Management with Foregone Income

**Scenario Description:**

Temporary suspension of crop production for one year to provide foraging habitat for declining wildlife species. A wildlife habitat evaluation indicated that food is a limiting resource for targeted wildlife. Annual weeds such as foxtails and ragweeds provide significant sources of food for ground birds (e.g. northern bobwhite). The field is lightly disked to encourage germination of annual weeds. THIS SCENARIO MAY ONLY BE APPLIED ON THE SAME FOOTPRINT ONE (1) TIME BECAUSE OF PROGRAM RESTRICTIONS ON FORGONE INCOME. Associated practices: Field Border (386), Tree and Shrub Establishment (612), Conservation Cover (327), Hedgerow Planting (422), Restoration and Management of Rare or Declining Species (643), Early Successional Habitat Development and Management (647).

**Before Situation:**

Cropland planted to annual crop and harvested. Production methods severely limit growth of annual weeds that are an important food source for targeted wildlife. Wildlife habitat evaluation indicates food resources are a limiting factor.

**After Situation:**

Land is temporarily removed from crop production. Annual weeds such as foxtails and ragweed flourish, providing foraging areas for targeted wildlife species. Wildlife habitat evaluation indicates habitat is provided for targeted species.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $352.03

**Scenario Cost/Unit:** $352.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 0.25 | $7.66 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.5 | $178.04 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.5 | $153.13 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #319 - Delayed Mowing

**Scenario Description:**

This scenario addresses inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species or provide nesting habitat by delaying mowing of fields until after the nesting season. Mowing can be used to increase structural diversity by creating areas of shorter vegetation prefered by some species or certain life stages of species. The typical setting for this scenario is at the edges of crop fields, woodlands, or brushy areas, and in odd areas such as pivot corners. Where chemical control of undersirable vegetation including invasives is required to reduce competition for the desired plant community, conservation practice 315, Herbaceous Weed Control, or 314, Brush Management, should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservariton practice 327, Conservation Cover.

**Before Situation:**

The site is static or trending to later successional plant community, the disturbance regime to maintain an earlier successional plant community is lacking. Competition for sunlight from dense stands prevents seeding establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

**After Situation:**

Early successional habitat maintained, mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased. Fields/sites are not cut until after the state established nesting season timeframe is completed. Sites are also managed to maintain some winter and early spring cover by limiting the amount of fall mowing that occurs.

**Feature Measure:** Size of treated area.

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,043.40

**Scenario Cost/Unit:** $104.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 10 | $306.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 11 | $374.22 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #328 - Interseeding Milkweed Into Existing Habitat

**Scenario Description:**

Inter-seeding milkweed into an existing stand of vegetation that has sufficient nectar plant richness and distribution, but lacks reproductive habitat (milkweed is lacking). Existing vegetation will be treated with herbicides in strips. Entire area will be burned or mowed prior to application of herbicides to 6-10 foot wide strips. Drilling of milkweed will be in the treated (herbicide strips). Seeding in strips will be 25% of the field.

**Before Situation:**

An open field that may support enough forb species richness, abundance and distribution to provide good or excellent monarch nectaring habitat, but milkweed is lacking. These conditions fail to meet the limiting factor for monarchs as required to meet Upland Wildlife Habitat (654) as reproductive habitat is identified as the limiting factor for this species. Application of the Monarch WHEG finds the habitat quality rating to be poor or fair.

**After Situation:**

The open field supports good or excellent monarch reproductive habitat. Application of the Monarch WHEG finds the habitat quality rating to be good or excellent.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $1,391.56

**Scenario Cost/Unit:** $278.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 5 | $30.25 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 5 | $107.90 |
| Seeding Operation, No Till/Strip Till Planter | 1230 | No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor. | Acres | $27.52 | 5 | $137.60 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1.25 | $20.85 |
| Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability. | 2618 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a highly specialized mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed may have limited availability and be difficult to obtain, e.g. milkweed species. Restricted for use with Wildlife Habitat Planting (420) and Restoration of Rare or Declining Natural Communities (643). Includes materials and shipping. | Acres | $875.97 | 1.25 | $1,094.96 |

**Practice:** 646 - Shallow Water Development and Management

**Scenario** #1 - Shallow Water Management

**Scenario Description:**

This scenario addresses inadequate habitat for fish and wildlife on cropland. The resource concern is addressed by providing shallow water habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. Sites are flooded up to a depth of 18" with an average depth of 9". Water is provided by natural flooding and/or precipitation.

**Before Situation:**

There is inadequate habitat to provide optimum resting, nesting, and feeding habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.).

**After Situation:**

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If needed and dikes or water control structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and cost shared under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be cost shared to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

**Feature Measure:** Acre of shallow water

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $32.22

**Scenario Cost/Unit:** $32.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |

**Practice:** 646 - Shallow Water Development and Management

**Scenario** #2 - Shallow Water Management, High Level

**Scenario Description:**

This scenario addresses inadequate habitat for fish and wildlife on cropland. To facilitate practice code 643, 644, 645, or 395, seasonal shallow water is provided annually for target species by purchasing of water, lifting of such water, monitoring of the water quality, response by target plant community, use by target flora or fauna. Sites are flooded up to a depth of 18"with an average depth of 9". Monitoring and adaptive management accomplished of existing water control structures is accomplished to meet very specific conditions needed to address previously identified degraded plant conditions or inadequate habitat for fish and/or wildlife. This high-level managmenet is applied to lands used for crop, pasture, hay, forests or wildlife lands where target flora and fauna have been identified as a primary concern. Loss of some level of crop, forage, hay or forest products may occur depending on site specific conditions.

**Before Situation:**

The site has existing infrastructure (reliable water source, dikes, water control structures, pumps, gates) to provide a reliable seasonal water source. The site is not subject to frequent natural flooding. The potential benefits to target fauna and flora is not being captured. The purchase of water, supply of water and intensive managment of season water, coupled with monitoring, adaptive managment from highly trained individuals will fully address the identifed degraded plant conditions and/or inadequate habitat for fish and/or wildlife.

**After Situation:**

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If Dikes or Water Control Structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and cost shared under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be cost shared to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

**Feature Measure:** Acre of shallow water

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $460.82

**Scenario Cost/Unit:** $460.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Feet | $427.02 | 0.75 | $320.27 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |

**Practice:** 646 - Shallow Water Development and Management

**Scenario** #16 - Excavated Shallow Water Area

**Scenario Description:**

Resource inventory/Habitat Evaluations indicate that seasonal habitat components are needed to provide specific life cycle requirements that are currently unavailable or inadequate (e.g. - breeding habitat for salamanders). A shallow water area (typically 1 acre) is created by shallow excavation that exposes the groundwater table and/or intercepts surface runoff. Three to four inches of topsoil are removed from the planned shallow water area and stockpiled. The area is excavated an additional 15 inches on average based on planned average water depths. Once appropriate depth is achieved, the stockpiled topsoil is replaced to provide a suitable growing medium for desired vegetation. The excavated material is moved 100 feet on average. This scenario does not include mulching or seeding of the shallow water area, spoil areas, or buffers. Establishment of vegetation to enhance habitat and control erosion will be accomplished using other Conservation Practices (e.g. Wildlife Habitat Planting (420), Critical Area Planting (342), Conservation Cover (327).

**Before Situation:**

The planning unit is typically located on cropland, pasture or fallow fields. Small areas that hold water for short periods of time are not present. As a result, critical habitat components needed to provide specific life cycle requirements for target species are unavailable or inadequate.

**After Situation:**

A shallow depression (typically 1 ac) has been excavated to expose the groundwater table and/or intercept surface runoff, resulting in seasonal surface inundation. The excavated material is placed on one side of the shallow water area and formed into a small mound or is spread evenly. The seasonal standing water provides habitat for waterfowl, wading birds, reptiles and amphibians. Once constructed, these areas may contain naturally occurring vegetation or can be seeded using Conservation Practice Standard 420, Wildlife Habitat Planting.

**Feature Measure:** CyYd excavated

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,823.00

**Scenario Total Cost:** $11,441.08

**Scenario Cost/Unit:** $4.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 2823 | $10,868.55 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 646 - Shallow Water Development and Management

**Scenario** #17 - Embankment Shallow Water Area on Low Sloped Land

**Scenario Description:**

Resource inventory/Habitat Evaluations indicate that seasonal habitat components are needed to provide specific life cycle requirements that are currently unavailable or inadequate (e.g. - breeding habitat for salamanders). A shallow water area (typically 5 acres) is created on low sloped (typically less than 2%) land where surface runoff may be intercepted and ponded by impounding. Material is excavated from the upper portion of the slope, and piled on the downslope side of the planned shallow water areas to form a berm approximately 1,000 ft in length with an average height of 2.5 ft. Top width of the berm is 8 ft with 4:1 side slopes. Berm material is rolled/compacted. Three inches of topsoil is replaced on berm and spoil source area. This scenario does not include mulching and seeding of shallow water area, embankment, spoil areas, or buffers. Areas with soil disturbance should be stabilized using additional NRCS Conservation Practice Standards. Establishment of vegetation to enhance habitat and control erosion will be accomplished using other Conservation Practices (e.g. Wildlife Habitat Planting (420), Critical Area Planting (342), Conservation Cover (327).

**Before Situation:**

The planning unit is typically located on cropland, pasture or fallow fields with less than 2 percent slope. Small areas that hold water for short periods of time are not present. As a result, critical habitat components needed to provide specific life cycle requirements for target species are unavailable or inadequate.

**After Situation:**

A berm has been constructed and impounds surface runoff and rainfall to create a shallow water area with average water depths of 9 inches. The seasonal standing water provides habitat for waterfowl, wading birds, reptiles and amphibians. Once constructed, these areas may contain naturally occurring vegetation or can be seeded using Conservation Practice Standard 420, Wildlife Habitat Planting. Sites outside of the shallow water area where soil disturbance occurred (e.g. - spoil areas) as a result of practice implementation should be planted or otherwise stabilized to ensure erosion does not occur.

**Feature Measure:** Cubic Yards Excavated

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 2,352.00

**Scenario Total Cost:** $17,600.34

**Scenario Cost/Unit:** $7.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1834 | $7,721.14 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 2352 | $9,055.20 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario** #1 - Mowing

**Scenario Description:**

This scenario addresses inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation prefered by some species or certain life stages of species. The typical setting for this scenario is at the edge of crop fields, in pastures, hayfields, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control or 314 brush management should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 550 range seeding or 327 Conservation Cover.

**Before Situation:**

The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

**After Situation:**

Early successsional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

**Feature Measure:** Size of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $1,083.48

**Scenario Cost/Unit:** $108.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 10 | $306.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario** #2 - Disking

**Scenario Description:**

This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by disking vegetation and creating bare ground. The typical setting for this scenario is at the edge of crop fields, in pastures, and in odd areas such as pivot corners. This scenario is applicable nationwide. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

**Before Situation:**

The site is static or trending to higher successional plant species. The disturbance regime to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are often dense and inhibit the movements of younger wildlife species such as game bird chicks.

**After Situation:**

The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openness of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

**Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $235.19

**Scenario Cost/Unit:** $47.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 5 | $66.05 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario** #3 - Early Successional Wildlife Openings

**Scenario Description:**

Such heavy density cuts, having a span of no less than 2X the average stand height, are created by cutting all woody vegetation >2" DBH in forest stands with the intent to regenerate shade intolerant species. The treated forest stand must be mature enough to produce viable seed, or it must be reasonably adjacent to desirable mature trees which will provide adequate seed to regenerate the targeted vegetation. This scenario includes treatments which utilize clear-cut, seed tree, and shelterwood forest regeneration methods which have been determined to need implementation with the use of heavy equipment (i.e. feller buncher, tree shear, masticator, etc.) and/or hand tools (i.e. chainsaw, brush saw, ax, handsaw, etc.). At the professional biologist's or forester's discretion 10-20 trees per acre may be left scattered or in groups. Tree tops can be loped and left in place using CPS-384. This EQIP payment scenario will account for regeneration method cost components which are not associated with the aspects of a commercial tree harvest. Starting in 2016, this scenario can be utilized to clonally regenerate aspen (coppice).

**Before Situation:**

Young forest dominated by pole-sized timber (4 to 10 inches DBH). Early successional shrub habitat is lacking in the forest block. Forest canopy needs to be opened to stimulate shrub growth in the under story.

**After Situation:**

Minimum 5 acre opening is created. Large mast trees or other species valuable to wildlife may be retained at a rate of 10 to 12 trees per acre. Wildlife habitat is improved with the increase of sunlight to the forest floor. Some slash has been left in the openings to provide cover and habitat for amphibians and reptiles.

**Feature Measure:** Size of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $7,854.41

**Scenario Cost/Unit:** $1,570.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Feller buncher | 941 | Equipment and power unit costs. Labor not included. | Hours | $153.24 | 30 | $4,597.20 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 30 | $1,494.30 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 15 | $802.65 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario** #4 - Wildlife selective tree felling

**Scenario Description:**

Prior forest or shrubland activities (land abandonment, planned regeneration cuts, or exploitive cuts) have triggered the establishment of advanced regeneration of desirable tree and shrub species, but left behind a residual overstory which has typically lost its commercial value and is now shading the new forest stand. This scenario is intended to address scattered tree removal of =35 trees per acre. Greater densities should be addressed under other scenarios such as Early Successional Wildlife Openings. The residual overtopping trees are typically >4"DBH. With the exception of 15-20 trees per acre (left scattered or in groups) all overtopping stems should be manually cut or triple girdled with a chainsaw, or killed with herbicide. Soft mast producing trees and existing snags can be retained at the foresters' discretion. The resulting cut trees should be utilized for their highest potential product, or left in place to provide additional wildlife habitat value. This EQIP payment scenario will only account for the non-commercial tree cutting or killing cost components

**Before Situation:**

Tree canopy beginning to close and shade out shrubland habitat, reducing wildlife value for early successional species. Aspen too mature to provide adequate wildlife habitat.

**After Situation:**

Large trees removed to an acceptable level to promote shrubland habitat, improving wildlife habitat with the resulting increase of sunlight reaching the forest floor. Aspen were cut, allowing regeneration and increased habitat for wildlife.

**Feature Measure:** No. of Trees Cut

**Scenario Unit:** Each

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $1,164.82

**Scenario Cost/Unit:** $29.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 10 | $66.50 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 10 | $247.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario** #5 - Wildlife feathered edge

**Scenario Description:**

Create a transitional zone of early successional shrub habitat between grassland and forestland by removing trees >2 inches DBH. Zone of shrubs will reduce predation of wildlife nests and provide better escape cover for wildlife moving between grassland and forestland. Shrubs will also increase food availability along the edge of the forest. Cuts will occur along the edge of forestland where the forest abruptly joins grassland or cropland. Cuts should occur from September through March to minimize disturbance to nesting birds and roosting forest bats. The area to be treated is flagged out by a professional biologist or forester. Cuts will be linear and ideally, 150 feet wide. The wider the width of the cut, the better the protection, cover and food provided to wildlife. Location of feathered edges can be adjusted to avoid steep slopes, streams, wetlands, and other environmentally sensitive areas. Tree tops can be loped and left in place to provide contiguous cover and habitat for reptiles and amphibians.

**Before Situation:**

Young forest edge dominated by pole-sized timber (4 to 10 inches DBH). Edge between the forestland and adjoining grassland or cropland is abrupt and provides poor cover and food for wildlife. Forest canopy needs to be opened to stimulate shrub growth in the under story, creating a transitional zone of shrubs between the grassland/cropland and forest.

**After Situation:**

Cut trees have increased sunlight penetration to the ground, encouraging growth of shrubs. Transitional zone of shrubs, 150 feet wide, between grassland/cropland and forestland now provides nesting and escape cover, as well as food for wildlife. Some slash has been left on-site to provide contiguous cover and habitat for reptiles and amphibians.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $3,592.70

**Scenario Cost/Unit:** $1,197.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 3 | $19.95 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 15 | $1,608.15 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 15 | $747.15 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 3 | $160.53 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario** #6 - Low Shade Removal

**Scenario Description:**

The purpose of this treatment is to increase understory light levels to facilitate an increase of desirable seedlings and herbaceous vegetation and prevent excessive competition from undesirable species. Advanced seedling and sapling reproduction is either non-existent or is very small. All undesirable understory and midstory vegetation should be mechanically and/or chemically killed. Cut stems need not be removed. In addition to herbaceous vegetation and shrubs, suppressed, intermediate, and possibly weak co-dominant trees may be removed at the discretion of the forester to achieve adequate understory light levels. Reduce relative density to 70-80% (density reduction at the discretion of forester), focusing removal on seed source trees of undesirable species. Few, if any, gaps in the main canopy should be created to prevent the germination of undesirable species. Soft mast producing trees can also be retained at the foresters' discretion. Where possible, cuts should not occur from April through October to minimize disturbance to roosting Indiana Bats and nesting birds. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Herbaceous Weed Control (315), Access Control (472), Critical Area Planting (342), Brush Management (314), and Forest Stand Improvement (666).

**Before Situation:**

Understory and midstory vegetation is comprised of undesirable species of pole-timber, saplings, shrubs, or herbaceous plants that cast dense shade on the forest floor. Understory light levels are too low for the successful establishment of desirable tree seedlings, shrubs, and herbaceous vegetation, which are therefore not abundant or are too small.

**After Situation:**

A minimum of 10 ac. is treated. Understory light levels are enhanced so that desirable herbaceous vegetation, shrubs, and desirable seedlings have high survival and can increase in root and shoot growth.

**Feature Measure:** Size of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $9,165.48

**Scenario Cost/Unit:** $916.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 40 | $266.00 |
| Brush Chipper, 6 in. capacity | 938 | Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hours | $32.57 | 30 | $977.10 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 20 | $1,023.20 |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 30 | $966.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 25 | $3,307.00 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 10 | $166.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario** #7 - Shelterwood Cut

**Scenario Description:**

The purpose of this treatment is to increase understory light levels so that small advanced reproduction (already present) can grow and will be large enough to compete effectively following overstory removal. This treatment will prepare the stand for an eventual overstory removal which generally occurs within 4-8 years. All undesirable understory and midstory vegetation should be cut or killed with herbicide. Reduce relative density to 40-60%, depending on the size of the advanced reproduction and desired species (density reduction at the discretion of forester). Removals should be focused on seed source trees of undesirable species, all suppressed and intermediate trees, and some co-dominant trees. Retain trees with large, healthy crowns to produce seed and to moderate the ground-level environment. Where possible, cuts should not occur from April through October to minimize disturbance to roosting Indiana Bats and nesting birds. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Herbaceous Weed Control (315), Access Control (472), Critical Area Planting (342), Brush Management (314), and Forest Stand Improvement (666).

**Before Situation:**

Adequate numbers of established advanced reproduction are present, but midstory and overstory shade is limiting its development. Either desirable reproduction is too small, or the likelihood of competition is too great to allow for a final (overstory) removal cut.

**After Situation:**

Minimum of 10 ac. is treated. Understory light levels are enhanced to promote growth of advanced reproduction to competitive sizes. After implementation of this practice (4-8 years) the stand is ready for an overstory removal.

**Feature Measure:** Size of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $8,402.98

**Scenario Cost/Unit:** $840.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 40 | $266.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Brush Chipper, 12 in. capacity | 1869 | Brush Chipper, 12 inch capacity, typically 130 HP. Includes chipper and power unit. Does not include labor. | Hours | $69.66 | 20 | $1,393.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 25 | $3,307.00 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 20 | $333.60 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 647 - Early Successional Habitat Development-Mgt

**Scenario** #8 - Overstory Removal

**Scenario Description:**

The canopy overstory is selectively thinned to provide light to established seedlings. Large advanced reproduction is present and is ready to be released from overstory shade to create young forest habitat. Cutting should occur from September through March to minimize disturbance to nesting birds. Disturbance to roosting Indiana bats must also be considered. 10-12 trees per acre are retained for wildlife habitat. Around 20-30 trees are removed per acre. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Herbaceous Weed Control (315), Access Control (472), Critical Area Planting (342), Brush Management (314), and Forest Stand Improvement (666).

**Before Situation:**

Tree canopy is beginning to close and cause insufficient light to allow regeneration of established seedlings. An adequate number of advanced seedlings is present and large enough to compete effectively with anticipated competition once released.

**After Situation:**

Large canopy trees are removed to an acceptable level to ensure sufficient light is available to established seedlings to encourage growth. Stand is adequately stocked with well-distributed crop trees. Approximately 10 to 12 wildlife reserve trees are retained for wildlife habitat.

**Feature Measure:** Size of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $3,760.94

**Scenario Cost/Unit:** $752.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 60 | $399.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 15 | $370.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |

**Practice:** 649 - Structures for Wildlife

**Scenario** #1 - Nesting Box, Small no pole

**Scenario Description:**

A structure is provided to support the nesting and rearing of smaller targeted species, such as bees and birds, and is directly mounted to a tree, building or other structure. Addresses resource concern for wildlife of inadequate cover/shelter

**Before Situation:**

The area lacks sufficient nesting habitat sites (natural cavities). A suitable location to mount the box is available. Location and conditions suggest that predator guards are needed to prevent access by racoons or snakes.

**After Situation:**

The installation of nesting and rearing boxes support the life-cycle needs of targeted speces, such as birds, bats and pollinators. These structures/features enhance habitat, cover, and improve species survivability.

**Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $86.78

**Scenario Cost/Unit:** $86.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 0.25 | $8.06 |
| **Materials** | | | | | | |
| Habitat Box, Bird | 251 | Bluebird nesting box to increase nesting success. Each is 1-1/2 x 6 x 12-1/2 Inch with a 1-1/2 inch diameter opening. Includes materials and shipping. | Each | $33.61 | 1 | $33.61 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $45.11 | 1 | $45.11 |

**Practice:** 649 - Structures for Wildlife

**Scenario** #2 - Nesting Box, Small, with wood pole

**Scenario Description:**

Constructing a nest box and mounting on a pole. A structure is provided to support the nesting and rearing of targeted species, such as pollinators and birds. Trees, buildings or other structures are not available. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

**Before Situation:**

This area lacked sufficient nesting sites to support viable populations of targeted species. Location and conditions suggest that predator guards are needed to prevent access by racoons or snakes.

**After Situation:**

The installation nesting and rearing boxes support the life-cycle needs of targeted speces, such as blue birds and waterfowl. Location and conditions suggest that predator guards are not needed. These structures/features enhance habitat, cover, and improve species survivability.

**Feature Measure:** Number of structures with poles.

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $128.66

**Scenario Cost/Unit:** $128.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 0.75 | $24.17 |
| **Materials** | | | | | | |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 1 | $25.77 |
| Habitat Box, Bird | 251 | Bluebird nesting box to increase nesting success. Each is 1-1/2 x 6 x 12-1/2 Inch with a 1-1/2 inch diameter opening. Includes materials and shipping. | Each | $33.61 | 1 | $33.61 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $45.11 | 1 | $45.11 |

**Practice:** 649 - Structures for Wildlife

**Scenario** #3 - Nesting Box, Large

**Scenario Description:**

A structure is provided to support the nesting and rearing of larger targeted species such as waterfowl, bats and barn owls, and is directly mounted to a tree, building or other structure. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

**Before Situation:**

The area lacks sufficient overall habitat conditions to support viable populations of targeted species. A suitable location to mount the box is available. A predator guard is needed.

**After Situation:**

The installation of nesting and rearing boxes support the life-cycle needs of targeted species, such as birds, bats and pollinators. Because of suitable location and conditions the nesting box can be directly mounted such as on a tree or building, thereby eliminating the need for mounting poles and predator guards. Species such as cavity dwelling birds and pollinators use this approach, but this treatment is not limited to those species. These structures/features enhance habitat, cover, and improve species survivability.

**Feature Measure:** Number of structures.

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $171.57

**Scenario Cost/Unit:** $171.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 0.5 | $9.28 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 0.5 | $16.11 |
| **Materials** | | | | | | |
| Habitat Box, waterfowl | 1449 | Wood Duck Box, typically 24x11x12 inch with 4 inch wide oval entrance, single. Includes material and shipping only. | Each | $101.07 | 1 | $101.07 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $45.11 | 1 | $45.11 |

**Practice:** 649 - Structures for Wildlife

**Scenario** #4 - Nesting Box or Raptor Perch, Large, with Pole

**Scenario Description:**

Constructing a nest box on a steel pole with a predator guard where needed. A structure is provided to support the nesting and rearing of larger targeted species such as woodducks, bats, barn owls. Addresses Resource Concern: Inadequate Cover/Shelter.

**Before Situation:**

The area lacks sufficient overall nesting sites to support viable populations of targeted species. Predator guards provide needed protection of target species during nesting and rearing.

**After Situation:**

The installation of pole mounted nesting and rearing boxes support the life-cycle needs of targeted species, such as bats and waterfowl.

**Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $408.30

**Scenario Cost/Unit:** $408.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Pipe, steel, galvanized, threaded, 1 1/4 inch, schedule 40 | 256 | Spec. A-53, includes coupling and clevis hanger assembly sized for covering, 10 ft. OC | Feet | $22.99 | 10 | $229.90 |
| Habitat Box, waterfowl | 1449 | Wood Duck Box, typically 24x11x12 inch with 4 inch wide oval entrance, single. Includes material and shipping only. | Each | $101.07 | 1 | $101.07 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $45.11 | 1 | $45.11 |

**Practice:** 649 - Structures for Wildlife

**Scenario** #5 - Escape Ramp

**Scenario Description:**

Retrofit an existing watering trough/tank with an appropriately designed and installed wildlife escape ramp to reduce wildlife mortality and maintain water quality within the watering facility.

**Before Situation:**

Existing watering facilities lack escape potential for wildlife. This results in death of the small wildlife accessing the facility for water, and resulting poor water quality as the animal decays.

**After Situation:**

Watering facilities provide wildlife safe access. Water quality is improved within the watering facility and wildlife mortality is reduced.

**Feature Measure:** Each Ramp

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $94.51

**Scenario Cost/Unit:** $94.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 0.5 | $16.11 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound. | Each | $78.40 | 1 | $78.40 |

**Practice:** 649 - Structures for Wildlife

**Scenario** #6 - Fence Markers, Vinyl Undersill

**Scenario Description:**

Existing fences are retrofitted with vinyl markers that increase wire visibility and reduce mortality due to collision for wildlife species of concern. Markers are installed approximately every 3 feet along top wire. Scenario is typically implemented along fences in potential high risk areas (red areas in SGI Fence Collision Risk Model) or where a known problem exists.

**Before Situation:**

Wire fences located in high risk areas pose a collision threat to wildlife of special concern.

**After Situation:**

Fence related mortality of species of special concern is reduced.

**Feature Measure:** feet of fence marked

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $275.98

**Scenario Cost/Unit:** $0.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 0.5 | $9.28 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| **Materials** | | | | | | |
| Vinyl Undersill Strips | 241 | Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only. | Feet | $0.08 | 1320 | $105.60 |

**Practice:** 649 - Structures for Wildlife

**Scenario** #7 - Brush Pile - Small

**Scenario Description:**

Small brush piles are created to provide shrubby/woody escape cover for wildlife. Pushing or cutting of select small trees and placement in selected locations to provide wildlife cover. Typical scenario of 10' x 20' area for structure covered by interlocking limbs of trees less than 12 inches in diameter.

**Before Situation:**

The existing habitat lacks escape, ground nesting and safe loafing cover.

**After Situation:**

Small brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

**Feature Measure:** brush piles

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $45.94

**Scenario Cost/Unit:** $45.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 0.5 | $28.93 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 0.5 | $17.01 |

**Practice:** 649 - Structures for Wildlife

**Scenario** #8 - Brush Pile - Large

**Scenario Description:**

The typical scenario is hardwood and mixed wood forest stands and open areas where wildlife cover and ground nesting is limited. Brush piles will be created from trees and shrubs on site and will be constructed by piling brush and loose branches on top of a base frame comprised of large logs.

**Before Situation:**

Forest edges, forest openings, pastures, and wildlife lands have limited escape cover, ground nesting habitat and safe loafing areas, resulting in unsuitable habitat and reduced survival. Wildlife such as cottontail will need other cover nearby for the success of the practice.

**After Situation:**

Large brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species. An average 3 brush piles per acre have been constructed. Typical size is minimum 12-20 feet wide by 6 feet high. Escape cover, nesting habitat and safe loafing areas have been created and will increase wildlife survival.

**Feature Measure:** brush piles

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $244.44

**Scenario Cost/Unit:** $244.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 1.5 | $86.78 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1.5 | $9.98 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 1.5 | $51.03 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #7 - Supplemental Planting, Container

**Scenario Description:**

Parts of the windbreak being renovated have died. Supplemental plantings of containerized trees/shrubs will improve the effectiveness and longevity of the windbreak. Resource concerns include Soil erosion - Wind erosion, Degraded plant condition -Inadequate structure and composition, and Livestock production limitation - Inadequate livestock shelter. Associated Practices: Conservation Cover (327), Fence (382), Windbreak/shelterbelt Establishment (380), Hedgerow Planting (422).

**Before Situation:**

Dead trees/shrubs are inhibiting windbreak effectiveness. A one (1.0) acre windbreak/shelterbelt is expanded through the planting of containerized tree and shrub seedlings at a average spacing of 8' (shrubs 4'-6', deciduous/conifer trees 8'-12') within row and 15'-20' between rows. Planting is achieved through hand planting.

**After Situation:**

The integrity and function of the windbreak is restored.

**Feature Measure:** Number of plants replaced

**Scenario Unit:** Each

**Scenario Typical Size:** 350.00

**Scenario Total Cost:** $4,767.88

**Scenario Cost/Unit:** $13.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2 | $25.62 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 60 | $1,933.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Tree, Conifer, Seedling, Medium | 1514 | Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only. | Each | $0.66 | 350 | $231.00 |
| Tree shelter, solid tube type, 5 in. x 48 in. | 1571 | 5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 350 | $1,610.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 48 in. | 1582 | 3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.01 | 350 | $703.50 |

**Practice:** 654 - Road/Trail/Landing Closure and Treatment

**Scenario** #1 - Road/Trail Abandonment/Rehabilitation (Light)

**Scenario Description:**

A 12' wide trail is reshaped to natural conditions. This scenario includes using light equipment such as a backhoe for the installation of water control devices such as water bars, rolling dips, controlling access, use of woody residue and pulling drainages on 500 feet of road on 35% hill slopes and a moderate grade. Cool season native grasses are re-established by seeding. Some light hand work may be needed to clear site for the equipment. This practice addresses one or more resource concerns: Excessive sediment in surface waters, Habitat degradation, and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

**Before Situation:**

The legacy trail/roads are severely affecting wetland/riparian areas, slope stability, and water quality. The trail/roads can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access is possible. Therefore abandonment and rehabilitation is the best way to address the resource concerns and problems that are being created.

**After Situation:**

The resource concerns are addressed by the abandonment of the road and its drainage elements, and by re-seeding to native grasses.

**Feature Measure:** length

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $2,120.51

**Scenario Cost/Unit:** $4.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 4 | $231.40 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 3 | $19.95 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 1 | $12.27 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 4 | $74.20 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $3.41 | 85 | $289.85 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 654 - Road/Trail/Landing Closure and Treatment

**Scenario** #2 - Road/Trail/Landing Closure and Treatment, <35% hillslope

**Scenario Description:**

The practice includes permanent road/trail/landing closure, treatment, or removal and to hydrologically reconnect the hillslope to applicable drainage networks. The treatment will prohibit future access. The typical scenario includes decommissioning a 500 ft of an 18-foot wide trail/road with a landing on 30% forest slopes, using heavy equipment such as a bulldozer or similar equipment (excavator or road grader with ripper) to re-shape and obliterate the road base and landings in order to re-establish native, cool season vegetation. It also includes restoring hydrology with the removal of culverts and drainage fills. Necessary erosion control measures such as water bars are installed. Some hand-work may be necessary to clear the site for the equipment. The work will be supervised by a consultant forester, land manager, or other resource professional. Tree/Shrub Site Prep is not included, however, Tree/Shrub Planting is recommended. When completed, there is no additional maintenance with heavy equipment needed. This practice addresses one or more resource concerns: Excessive sediment in surface waters and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

**Before Situation:**

The legacy trail/road is severely affecting wetlands, riparian areas, slope stability, water quality and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access is possible. Therefore abandonment and site restoation are the best approaches to address the resource concerns and problems that are being created.

**After Situation:**

The resource concerns are addressed by the abandonment of the road and its drainage elements, and by re-seeding to native grasses.

**Feature Measure:** length

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $3,583.59

**Scenario Cost/Unit:** $7.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 6 | $440.94 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 3 | $375.33 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 3 | $173.55 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 4 | $26.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 1 | $12.27 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $3.41 | 225 | $767.25 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 3 | $149.43 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |
| **Mobilization** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 654 - Road/Trail/Landing Closure and Treatment

**Scenario** #3 - Road/Trail/Landing Closure and Treatment, >35% hillslope

**Scenario Description:**

The practice includes permanent road/trail/landing closure and treatment, and the hydrologically reconnection of the hillslope to applicable drainage networks. The treatment will limit future access. The typical scenario includes decommissioning a 24-foot wide, earthen road with landings on forest slopes over 35%, using a bulldozer or other heavy equipment such as an excavator or road grader with ripper to re-shape and obliterate the road base and landings in order to re-establish native vegetation. It also includes restoring hydrology with the removal of culverts and drainage fills. Necessary erosion control measures such as water bars are installed. The steep slopes makes this scenario costly due to the increased time needed to apply the measures and the need for additional water control devices. Some hand-work may be necessary to clear the site for the equipment. The work will be supervised by a consultant forester, land manager, or other resource professional. Tree/Shrub Site Prep is not included. However, Tree/Shrub Planting is recommended. When completed, there is no additional maintenance with heavy equipment needed. This practice addresses one or more resource concerns: Excessive sediment in surface waters and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

**Before Situation:**

The legacy trail/road is severely affecting wetlands, riparian areas, unstable slopes, water quality, and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access was possible. Therefore abandonment and site restoration are the best approaches to address the resource concerns and problems that are being created.

**After Situation:**

The resource concerns are addressed by the abandonment of the road and its drainage elements, and by re-seeding to native grasses.

**Feature Measure:** length

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $6,953.07

**Scenario Cost/Unit:** $13.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 4 | $212.84 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 6 | $798.30 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 6 | $347.10 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 1 | $12.27 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $3.41 | 500 | $1,705.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 18 | $612.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |
| **Materials** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 3 | $754.41 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 654 - Road/Trail/Landing Closure and Treatment

**Scenario** #14 - Road/Trail removal and restoration (Vegetative)

**Scenario Description:**

Minimal re-shaping to natural conditions using light equipment and the establishment of permanent vegetation. This scenario includes using smaller equipment (ag tractor/skidsteer/small dozer/backhoe/) for the installation of water control devices such as water bars and rolling dips, controlling access, and pulling drainages on 500 feet of 12' wide road on 5%-35% hill slopes and little grade. The site is re-vegetated to permanent improved grass and temporarily protected with a thin layer of hay mulch. Soil amendments are applied as per the FOTG guidance. This practice addresses one or more resource concerns: Excessive sediment in surface waters, Wildlife habitat degradation, and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

**Before Situation:**

Legacy trail/road is not necessary and is affecting wetlands, riparian areas, water quality, and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access was possible. Therefore abandonment and site restoration are the best approaches to address the resource concerns and problems that are being created.

**After Situation:**

The re-vegetated, eliminated road addressed the resource concern.

**Feature Measure:** length of landing/trail(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $1,605.92

**Scenario Cost/Unit:** $3.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 1 | $57.85 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 1 | $20.13 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 1 | $11.87 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 1 | $12.27 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $3.41 | 100 | $341.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 15 | $18.60 |
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 10 | $10.10 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 10 | $5.90 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 1 | $109.15 |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $107.37 | 1 | $107.37 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 1 | $126.91 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 655 - Forest Trails and Landings

**Scenario** #1 - Trail Installation

**Scenario Description:**

Forest Trails and/or Landings will be constructed for the purpose of providing periodic or infrequent access and staging areas in a gently sloping forest stand. Such infrequently used access routes (14' wide) and staging areas facilitate the application of other conservation practices, monitoring and the removal of pre-commercial forest products. Installation will include removal of woody vegetation as needed, a minimum amount of blading and soil disturbance, and the installing of water control measures such as water bars, broad-based dips, turn-ups, belt deflectors, etc. It will not include measures more common to Access Roads such as gravelling, ditching, or culverts. 2000' of new trail is to be cut, cleared and stabilized across land that has <10% slope; trail slope averages 2%, requiring a total of 8 water bars. Installation will be supervised by a consultant forester, land manager, or other resource professional. Other related practices such as Stream Crossing, Critical Area Planting, Access Road, and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario. Resource concerns include: Soil Erosion, Degraded Surface Water Quality, Degraded Plant Condition, and Degraded Wildlife Habitat.

**Before Situation:**

Access to the tract is not available for occasional travel by the landowner or manager for the purposes of monitoring, implementing conservation practices and/or the removal of forest products. Improperly installed trails and landings will cause soil erosion and water quality problems.

**After Situation:**

A trail system is installed that provides access to the forested tract and no longer causes excessive erosion or water quality resource concerns.

**Feature Measure:** Length of trail treated

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $2,414.69

**Scenario Cost/Unit:** $1.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 17 | $113.05 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 17 | $547.74 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 655 - Forest Trails and Landings

**Scenario** #2 - Trail Erosion Control w/o Vegetation, Slopes < 35%

**Scenario Description:**

Rehabilitation of an existing forest trail segments (+20% slope and <5% grade) by addressing legacy resource issues to sustain long-term use. The degraded single-lane trail (14' wide, including cut and fill), requires the installation of erosion control measures using heavy equipment such as dozers, graders, backhoes, and/or excavators. This scenario applies to only those segments of the trail system that have resource concerns requiring rehabilitation. Approximately 500' of existing trail is to be repaired across land that has <25% slope; trail slope averages 5%. Scenario includes designing and installing measures such as out sloping (or changing surface drainage), rolling dips, water bars, and ditch outs as needed. Installation will be supervised by a consultant forester, land manager, or other resource professional. Other practices such as Stream Crossing, Critical Area Planting, Access Road, and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario. Resource concerns include: Soil Erosion, Degraded Surface Water Quality, Degraded Plant Condition, and Degraded Wildlife Habitat.

**Before Situation:**

Trails are delivering sediment to waterways, impacting riparian areas and wetlands, with possible effect to T&E species. The system's usefulness for access is also being compromised by inadequate erosion and drainage control systems. However rehabilitation over abandonment is an acceptable course of action.

**After Situation:**

Trails and landings provide access and no longer adversely affect the natural resources.

**Feature Measure:** Each Structure

**Scenario Unit:** Each

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $788.41

**Scenario Cost/Unit:** $197.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 2 | $146.98 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 1 | $6.65 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 655 - Forest Trails and Landings

**Scenario** #3 - Trail Erosion Control w/o Vegetation, Slopes >35%

**Scenario Description:**

Rehabilitation of an existing forest trail segments by addressing legacy resource issues such as excessive sedimentation to sustain long-term use. The degraded single-lane trail (14' wide, including cut and fill), requires the installation of erosion control measures using heavy equipment such as dozers, graders, backhoes, and/or excavators. This scenario applies to only those segments of the trail system that have resource concerns requiring rehabilitation. 500' of existing trail to be reapaired across land that has >35% slope; trail slope averages 15%. Scenario includes designing and installing measures such as out sloping (or changing surface drainage), rolling dips, water bars, and ditch outs as needed. Installation will be supervised by a consultant forester, land manager, or other resource professional. Other practices such as Stream Crossing, Critical Area Planting, Access Road, and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario. Resource concerns include: Soil Erosion, Degraded Surface Water Quality, Degraded Plant Condition, and Degraded Wildlife Habitat.

**Before Situation:**

Trails are delivering sediment to waterways, impacting riparian areas and wetlands, with possible effect to T&E species. The system's usefulness for access is also being compromised by inadequate erosion and sediment control systems. However rehabilitation over abandonment is an acceptable course of action.

**After Situation:**

Trails and landings provide access and no longer adversely affect the natural resources.

**Feature Measure:** Each Structure

**Scenario Unit:** Each

**Scenario Typical Size:** 8.00

**Scenario Total Cost:** $1,567.08

**Scenario Cost/Unit:** $195.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 655 - Forest Trails and Landings

**Scenario** #4 - Grading and Shaping with Vegetative Establishment

**Scenario Description:**

Rehabilitation of existing forest access trails and landings on a medium slope by addressing rutting, erosion, and sedimentation. Typically the trail is a single, existing 18-foot wide (including cut and fill) seasonal road prism on gently sloping terrain requiring sustained erosion control measures applied with heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages and to establish a vegetative cover. This scenario includes designing and installation measures such as cross drains, rock drains, relief drainage, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. It also includes seedbed preparation, seeding and soil amendments determined to be needed. Some hand work (chainsaw) will be needed to allow the use of the equipment. The work will be supervised. Other practices such as Stream Crossing, and Critical Area Planting. Access Road and Structure for Water Control can be adjacent/appurtenant but not part of the practice scenario. Treatments are for long-term reduction of sediment, restore fish habitat, create fire access and to move routes off unstable slopes. Resource concerns include: Excessive sediment in surface waters, Concentrated and Sheet & rill flow erosion, Soil compaction, and Habitat degradation.

**Before Situation:**

Trail/landings are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

**After Situation:**

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

**Feature Measure:** Length of trail treated

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $7,680.72

**Scenario Cost/Unit:** $3.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $53.21 | 16 | $851.36 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 16 | $925.60 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8 | $53.20 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 1 | $7.26 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $11.87 | 1 | $11.87 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 1 | $12.27 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 10 | $185.50 |
| Water Bars | 1500 | Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length. | Feet | $3.41 | 300 | $1,023.00 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 10 | $1,683.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 40 | $1,360.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Nitrogen (N), Ammonium Nitrate | 69 | Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.24 | 70 | $86.80 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Phosphorus, P2O5 | 73 | Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.01 | 55 | $55.55 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.59 | 40 | $23.60 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $109.15 | 1 | $109.15 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 1 | $45.45 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 655 - Forest Trails and Landings

**Scenario** #61 - Landing Installation

**Scenario Description:**

Forest Landings will be sized and constructed for the purpose of periodically providing staging areas in gently sloped forest stands to facilitate prescribed implementation of forest management activities and the removal of forest products. Installation will typically include the removal of woody vegetation, minor grading, the installing of water control measures (i.e. water bars, broad-based dips, turn-ups, belt deflectors, etc.), and the establishment of appropriate vegetation under the 342 Critical Area Planting Standard. Installation will be supervised by a consultant forester, land manager, or other resource professional.

**Before Situation:**

Forest products generated during prescribed management activities are currently not capable of being processed or staged before utilization or marketing. Processing and/or marketing typically facilitates prescribed forest management activities. Improperly installed landings may cause excessive soil erosion and threaten the water quality of surface waters.

**After Situation:**

A log landing is installed that provides adequate space to safely stage and process wood products generated by the implementation of prescribed forest stand management activities. Precautions have been taken to minimize soil erosion and/or water quality degradation of surface waters. With the appropriate choice of vegetation to stabilize the landing, additional benefits may be available to benefit wildlife and pollinator habitat.

**Feature Measure:** Acres of landing area

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,024.50

**Scenario Cost/Unit:** $3,024.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 12 | $881.88 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 20 | $133.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 12 | $597.72 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 655 - Forest Trails and Landings

**Scenario** #90 - Temporary Stream Crossing

**Scenario Description:**

The design and installation of a temporary stream crossing to address forest health and fish and wildlife habitat management and conservation needs. Improperly designed and/or installed stream crossings can have adverse effects on forest soils, water quality and aquatic wildlife. The temporary stream crossing will be restored and stabilized to natural conditions after use. Approaches to the stream crossing will also be stabilized and rehabilitated after use as necessary. Installation will be supervised by a professional forester, biologist or other qualified specialist. Permanent and/or high-traffic crossings will be designed and installed according to the Stream Crossing (578) Standard. Resource concerns include: Soil Erosion - Streambank, Shoreline, Water Conveyance Channels; Water Quality Degradation - Excessive sediment in surface waters; and, Fish and Wildlife - Inadequate Habitat - Water.

**Before Situation:**

Access to a forested tract is not available for the installation of conservation practices due to the lack of a suitable stream crossing(s), or, there is a liklihood that there will be traffic through the stream without the benefit of a designed and installed crossing.

**After Situation:**

Access was available for installing conservation practices, and the streambed, banks, and approaches have been restored to an initial or improved condition.

**Feature Measure:** Number of crossings

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,407.83

**Scenario Cost/Unit:** $1,407.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 2 | $250.22 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 2 | $115.70 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 2 | $99.62 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 655 - Forest Trails and Landings

**Scenario** #91 - Temporary Stream Crossing, Sensitive Site

**Scenario Description:**

The design and installation of a temporary stream crossing on a sensitive site using a wooden construction mat that protects resource concerns. Improperly designed and/or installed stream crossings can have adverse effects on forest soils, water quality and aquatic wildlife. The temporary stream crossing provides access to a forest stand to address forest health, fish and wildlife habitat management, and other conservation needs. The temporary stream crossing and mat are removed when the conservation activity is complete, and the stream crossing and approaches are restored and stabilized to natural conditions. Installation is supervised by a a professional forester, biologist, or other qualified specialist. Permanent and/or high-traffic stream crossings must be designed and installed according to the Stream Crossing (578) Standard. Resource concerns include: Soil Erosion - Concentrated flow erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Water; and, Water Quality - Excessive sediment in surface waters.

**Before Situation:**

A forested tract on a sensitive site cannot be accessed for the installation of conservation practices due to the lack of a suitable stream crossing(s), or, there is a liklihood that there will be traffic through the stream without the benefit of a designed and installed crossing.

**After Situation:**

The sensitive site was accessed for installing conservation practices, and the streambed, banks, and approaches have been restored and stabilized to natural conditions.

**Feature Measure:** Number of crossings of a 10 foot wi

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,284.22

**Scenario Cost/Unit:** $2,284.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 3 | $375.33 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 3 | $173.55 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 3 | $149.43 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Wood Construction Mat | 2657 | Wood Construction Mat weekly rental rate per Square Foot of mat. Material Only. Used for access and/or work pad in remote sensitive areas. | Square Feet | $1.27 | 480 | $609.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 655 - Forest Trails and Landings

**Scenario** #92 - Temporary Wetland Crossing, Sensitive Site

**Scenario Description:**

The design and installation of a temporary wetland crossing to gain access to a forest stand, built with construction mats to protect natural resources while addressing forest health management, wildlife habitat, and other conservation objectives. Improperly designed and/or installed wetland crossings can have adverse effects on soil health, water quality, and wildlife. After conservation activities are completed, the construction mats will be removed and the wetland crossing will be restored and stabilized to a natural condition. Installation is supervised by a a professional forester, biologist, or other qualified specialist. Resource concerns include: Water Quality - Excessive sediment in surface waters, and Fish and Wildlife - Inadequate Habitat - Water.

**Before Situation:**

A forested tract on a sensitive site cannot be accessed for the installation of conservation practices due to the lack of a suitable wetland crossing(s). There is a liklihood that there will be traffic through the environmentally sensitive wetland without the benefit of a designed and installed wetland crossing, leading to resource damage.

**After Situation:**

Conservation practices were installed in the forested tract. The environmentally sensitive wetland was crossed using a construction mat to stabilize the site, and the wetland was subsequently restored and stabilized to natural conditions.

**Feature Measure:** Crossing for 530 linear feet of wetl

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 6,600.00

**Scenario Total Cost:** $19,446.08

**Scenario Cost/Unit:** $2.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 6 | $750.66 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 6 | $347.10 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 6 | $193.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 6 | $298.86 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wood Construction Mat | 2657 | Wood Construction Mat weekly rental rate per Square Foot of mat. Material Only. Used for access and/or work pad in remote sensitive areas. | Square Feet | $1.27 | 13200 | $16,764.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 1 | $480.13 |

**Practice:** 656 - Constructed Wetland

**Scenario** #1 - Small <0.1 ac

**Scenario Description:**

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a small site (i.e. <0.1 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

**Before Situation:**

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

**After Situation:**

A 2000 sq foot constructed wetland (i.e. 20' x 100') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

**Feature Measure:** Area of Constructed Wetland

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,000.00

**Scenario Total Cost:** $1,417.30

**Scenario Cost/Unit:** $0.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 0.05 | $16.21 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 37 | $33.67 |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 74 | $209.42 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 1 | $24.50 |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 8 | $400.40 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $0.99 | 325 | $321.75 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 656 - Constructed Wetland

**Scenario** #2 - Medium 0.1 to 0.5 ac

**Scenario Description:**

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a medium site (i.e. 0.1 - 0.5 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

**Before Situation:**

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

**After Situation:**

A 0.25 acre constructed wetland (i.e. 45' x 240') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

**Feature Measure:** Area of Constructed Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 0.25

**Scenario Total Cost:** $3,890.00

**Scenario Cost/Unit:** $15,559.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 0.25 | $81.05 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 200 | $182.00 |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 400 | $1,132.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 14 | $451.08 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 1 | $24.50 |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 8 | $400.40 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $0.99 | 1350 | $1,336.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 656 - Constructed Wetland

**Scenario** #3 - Large > 0.5 ac

**Scenario Description:**

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff for a large site (i.e. >0.5 ac). All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

**Before Situation:**

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

**After Situation:**

A 1 acre constructed wetland (i.e. 95' x 460') will be constructed with an average 18" depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

**Feature Measure:** Area of Constructed Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,110.61

**Scenario Cost/Unit:** $11,110.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acres | $324.19 | 1 | $324.19 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 809 | $736.19 |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 1619 | $4,581.77 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 37 | $1,192.14 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 2 | $31.00 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.50 | 1 | $24.50 |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $50.05 | 8 | $400.40 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $0.99 | 3605 | $3,568.95 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 657 - Wetland Restoration

**Scenario** #1 - Drain Tile Plug

**Scenario Description:**

A Mineral Flat wetland is to be restored. The tract size is 25 Acres consists of surface saturated soils interspersed with shallow depressions that are not depressional class HGM wetlands. The wetland size is also 25 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site has been drained with a tile drain system. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

**After Situation:**

The drain tiles have been rendered non-functional by excavating 50 foot lengths of tile mains and laterals in 25 separate locations, and backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Feet of tile excavated/plugged

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,250.00

**Scenario Total Cost:** $2,709.46

**Scenario Cost/Unit:** $2.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 10 | $1,251.10 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 10 | $498.10 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 657 - Wetland Restoration

**Scenario** #2 - Riverine Levee Removal

**Scenario Description:**

A Riverine HGM tract on a large floodplain is to be restored. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. A 6 foot high, 80 foot wide levee prevents flood waters from entering the wetland to be restored. Lateral connectivity between the channel and floodplain is restored by excavating 2 sections, totaling 300 feet, from the levee at an upstream and downstream location, restoring dynamic stream flooding. About 5400 cubic yards of earth has been removed from the levee and trucked off-site. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting, critical area planting, and conservation cover.

**Before Situation:**

A levee prevents floodwater from entering the tract. The original cover was forest. The site has been completely cleared, and no suitable adjacent seedwall exists for natural regeneration of forest species. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**After Situation:**

Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Cubic Yard of Levee Removed

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 5,400.00

**Scenario Total Cost:** $19,497.45

**Scenario Cost/Unit:** $3.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 55 | $6,881.05 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hours | $104.49 | 55 | $5,746.95 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 55 | $1,871.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 55 | $2,739.55 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 4 | $1,920.52 |

**Practice:** 657 - Wetland Restoration

**Scenario** #3 - Depression Sediment Removal (Pothole)

**Scenario Description:**

Restore depressional areas (potholes) to a land-leveled wetland. Construct 10 potholes throughout project area. Potholes are of irregular shape and average 5,000-10,000 sf in size. Spoil is spread on surrounding area. Using critical area planting (342) practice, disturbed areas are vegetated to control erosion with plants native to the area. Associated practices: Critical area planting (342), conservation cover (327) and mulching (484).

**Before Situation:**

The wetland has been converted to agricultural production, with land leveling and erosion filling depressional areas. Depressional areas filled with an average 18 inches of soil, leaving area devoid of shallow water. Inadequate habitat for migrating, nesting and foraging waterfowl and other wildlife. High water table in the area indicates good suitability for restoration of depressional areas.

**After Situation:**

An average of 18 inches of material has been excavated from depressional areas. Depressions are re-spread with topsoil to supply organic material for seeding and restoring the depression. Ten depressions (potholes) have been restored throughout project area. Depressions are of irregular shape and average 5,000-10,000 sf in size. Spoil is spread or shallowly mounded on surrounding area. Using critical area planting (342) practice, disturbed areas are vegetated to control erosion with plants native to the area. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will address inadequate habitat for fish and wildlife, degraded plant condition and water quality degradation concerns listed above.

**Feature Measure:** Number of depressional areas exca

**Scenario Unit:** Each

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $28,389.26

**Scenario Cost/Unit:** $2,838.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 150 | $19,957.50 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 150 | $7,471.50 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 657 - Wetland Restoration

**Scenario** #4 - Estuarine Fringe Levee Removal

**Scenario Description:**

An Estuarine Fringe HGM landscape is to be restored. The wetland is subject to tidally induced water level fluctuations. The tract size is 120 acres, and the wetland area is 100 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The wetland has been converted to agricultural production by construction of a dike to prevent tidal flows. The dike has a culvert with a flapgate to allow surface water to flow out, but prevents tide water from entering. The dike is 7 feet high above the current marsh surface. The dike has side slopes of 3:1, with a 12 foot top. A suitable seedbank exists for natural regeneration of the original plant community. The soils are organic, and loss of hydrology has caused the land surface to subside 3 feet due to aerobic decomposition of organic matter (mineralization).

**After Situation:**

The dike has been breached in 4 locations, corresponding to the number of original inlet channels. The breach locations have 8 foot long steel sheet pile Structures for Water Control installed to prevent tidal surges from causing serious erosion on the subsided land surface. The original flap gate culvert has been removed. The dike is 4 feet higher than the weir crests, so the excavations are 4 feet by 8 feet long, with 3:1 side slopes. The culvert has been removed and salvaged by the landowner. Facilitating practices are Structure for Water Control. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Tract

**Scenario Unit:** Acres

**Scenario Typical Size:** 120.00

**Scenario Total Cost:** $2,167.43

**Scenario Cost/Unit:** $18.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 284 | $727.04 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 657 - Wetland Restoration

**Scenario** #5 - Riverine Channel and Floodplain Restoration

**Scenario Description:**

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

**After Situation:**

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Tract

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $8,704.26

**Scenario Cost/Unit:** $580.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 3025 | $7,744.00 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 657 - Wetland Restoration

**Scenario** #7 - Hydrologic restoration with embankment or ditch plug

**Scenario Description:**

An agricultural area drained with surface ditches is restored to the natural hydrologic conditions by plugging surface drainage with either a low embankment or ditch plugs. Material is excavated on-site. Excavated areas become shallow depressions within the restored wetland. Associated practice(s): Structure for Water Control, Tree and Shrub Planting, Herbaceous Riparian Buffer, Forest Riparian Buffer, Mulching

**Before Situation:**

Typically an agricultural area that was once wetland has altered the soil, vegetation, or hydrologic conditions. The natural hydrology was disabled by surface drainage.

**After Situation:**

Area now has hydrology restored. The surface ditches have been disabled. Embankment or ditch plugs constructed using on-site material excavated to create shallow depressional areas in the restored wetland. A low, 3 foot high, 250 ft long embankment or series of ditch plugs is created from material excavated on site.

**Feature Measure:** Feet of low embankment or ditch p

**Scenario Unit:** Feet

**Scenario Typical Size:** 250.00

**Scenario Total Cost:** $8,760.62

**Scenario Cost/Unit:** $35.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 20 | $2,502.20 |
| Dozer, 105 HP | 1320 | Track mounted Dozer with horsepower range of 90 to 125. Equipment and power unit costs. Labor not included. | Hours | $90.52 | 20 | $1,810.40 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 40 | $1,992.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 4 | $1,920.52 |

**Practice:** 658 - Wetland Creation

**Scenario** #1 - Excavated Wetland, Short Push Distance

**Scenario Description:**

A wetland is created on a mineral flat upland with moderately well or somewhat poorly drained soils, where surface runoff may be intercepted and ponded by excavation. Three to four inches of topsoil are removed and stockpiled, and the area is excavated an additional 18 inches on average. The stockpiled topsoil is replaced to provide a suitable growing medium for wetland vegetation. Three inches of topsoil are spread back over the wetland. The excavated material is moved 50 to 60 feet on average. Resource concern addressed is Inadequate Habitat for Fish and Wildlife - Habitat Degradation. Scenario does not include mulching and seeding of wetland or spoil area. Associated practices: Mulching, Critical Area Planting, Conservation Cover, Structure for Water Control.

**Before Situation:**

The site is cropland or pasture on upland.

**After Situation:**

A shallow depression has been excavated to intercept surface runoff and collect rainwater. The excavated material is placed on one side of the created wetland and formed into a small mound. The seasonal standing water provides habitat for wetland-dependent wildlife, including waterfowl, wading birds, and amphibians. Seeding of the wetland with wetland vegetation is accomplished via Conservation Cover, Wetland Wildlife Habitat Management, or Wildlife Planting.

**Feature Measure:** Acres of Wetland

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,301.55

**Scenario Cost/Unit:** $9,301.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, common earth, small equipment, 50 ft | 1220 | Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yards | $2.83 | 3227 | $9,132.41 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 658 - Wetland Creation

**Scenario** #11 - Embankment Wetland, Less than 2 Percent Slope

**Scenario Description:**

A wetland is created on a slightly sloped (less than 2%) upland where surface runoff may be intercepted and ponded by impounding. Material is excavated from the upper portion of the slope, and piled on the downslope side of the wetland to form a berm approximately 1,000 ft in length with an average height of 2 ft, top width of 8 ft, and 4:1 side slopes. Berm material is rolled/compacted. Three inches of topsoil is replaced on berm and spoil source area. Resource concern addressed: Inadequate Habitat for Fish and Wildlife - Habitat Degradation. Scenario includes building dike/berm. Scenario does not include mulching and seeding of wetland or spoil area. Associated practices: Critical Area Planting, Conservation Cover, Lined Outlet, Mulching, Structure for Water Control, Tree/Shrub Establishment, Underground Outlet, Wetland Wildlife Habitat Management, Wildlife Habitat Planting.

**Before Situation:**

Cropland or pasture on 0 to 1.9 percent slope.

**After Situation:**

A berm impounds surface runoff and rainfall to create a shallow wetland with average water depths of 9 inches. The seasonal standing water provides habitat for wetland-dependent wildlife, including waterfowl, wading birds, and amphibians. Seeding of the wetland with wetland vegetation is accomplished via Conservation Cover, Wetland Wildlife Habitat Management, or Wildlife Planting.

**Feature Measure:** Acres of Wetland Creation

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $13,285.56

**Scenario Cost/Unit:** $2,657.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 1304 | $5,489.84 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 626 | $2,272.38 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 1304 | $5,020.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 659 - Wetland Enhancement

**Scenario** #1 - Mineral Flat

**Scenario Description:**

A Mineral Flat wetland is to be enhanced. The tract size is 160 Acres consists of surface saturated soils interspersed with shallow depressions that are not depressional class HGM wetlands. The wetland size is also 160 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site has been drained with a tile drain system. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

**After Situation:**

The drain tiles have been rendered non-functional by excavating 50 foot lengths of tile mains and laterals in 24 separate locations, and backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Enhancement of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Tract

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $54,041.23

**Scenario Cost/Unit:** $337.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 24 | $2,153.28 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 80 | $28,485.60 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 40 | $12,250.00 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 40 | $10,084.40 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 24 | $816.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 659 - Wetland Enhancement

**Scenario** #2 - Riverine Levee Removal and Floodplain Features

**Scenario Description:**

A Riverine HGM tract on a large floodplain is to be enhanced. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The size of the tract is 100 acres. The wetland extent is 60 acres, and 40 acres are adjacent non-wetland. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no suitable adjacent seedwall exists for natural regeneration of forest species. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach.

**After Situation:**

The hydrology of the site is enhanced with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6" over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Tract

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $82,482.89

**Scenario Cost/Unit:** $824.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 19250 | $49,280.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 50 | $17,803.50 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 25 | $7,656.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 25 | $6,302.75 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 659 - Wetland Enhancement

**Scenario** #3 - Depression Sediment Removal and Ditch Plug

**Scenario Description:**

A Depressional HGM class wetland is to be enhanced. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6" of sediment in the bottom of the depression.

**After Situation:**

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Tract

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $26,750.85

**Scenario Cost/Unit:** $1,783.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 8067 | $20,651.52 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yards | $4.21 | 89 | $374.69 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 7.5 | $2,670.53 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 3.75 | $1,148.44 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 3.75 | $945.41 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 659 - Wetland Enhancement

**Scenario** #4 - Estuarine Fringe Levee Removal

**Scenario Description:**

An Estuarine Fringe HGM landscape is to be enhanced. The wetland is subject to tidally induced water level fluctuations. The tract size is 120 acres, and the wetland area is 100 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The wetland has been converted to agricultural production by construction of a dike to prevent tidal flows. The dike has a culvert with a flapgate to allow surface water to flow out, but prevents tide water from entering. The dike is 7 feet high above the current marsh surface. The dike has side slopes of 3:1, with a 12 foot top. A suitable seedbank exists for natural regeneration of the original plant community. The soils are organic, and loss of hydrology has caused the land surface to subside 3 feet due to aerobic decomposition of organic matter (mineralization).

**After Situation:**

The dike has been breached in 4 locations, corresponding to the number of original inlet channels. The breach locations have 8 foot long steel sheet pile Structures for Water Control installed to prevent tidal surges from causing serious erosion on the subsided land surface. The original flap gate culvert has been removed. The dike is 4 feet higher than the weir crests, so the excavations are 4 feet by 8 feet long, with 3:1 side slopes. The culvert has been removed and salvaged by the landowner. Facilitating practices are Structure for Water Control. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Tract

**Scenario Unit:** Acres

**Scenario Typical Size:** 120.00

**Scenario Total Cost:** $40,282.43

**Scenario Cost/Unit:** $335.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 284 | $727.04 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 60 | $21,364.20 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 30 | $9,187.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 30 | $7,563.30 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 3 | $1,440.39 |

**Practice:** 659 - Wetland Enhancement

**Scenario** #5 - Riverine Channel and Floodplain Restoration

**Scenario Description:**

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

**After Situation:**

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

**Feature Measure:** Acres of Tract

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $13,468.64

**Scenario Cost/Unit:** $897.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Excavation, Common Earth, side cast, small equipment | 48 | Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor. | Cubic Yards | $2.56 | 3025 | $7,744.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 7.5 | $2,670.53 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 3.75 | $1,148.44 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 3.75 | $945.41 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 659 - Wetland Enhancement

**Scenario** #6 - Enhanced wetland Topography

**Scenario Description:**

A wooded wetland is excavated to create wetland topography suitable for wildlife habitat and enhance hydric conditions. Pools are excavated on 10% of the site 6-18 inches deep. 5% of the trees in wooded area are removed during excavation to promote desired vegetation and create pools. Associated Practice(s) :Conservation Cover (327),Tree and Shrub Planting (612), Riparian Herbaceous Buffer (390), Riparian Forest Buffer (391), Wetland Wildlife Habitat Management (644), and Upland Wildlife Habitat Management (645).

**Before Situation:**

A wooded wetland or abandoned farmland that has grown into a wooded area is lacking wetland topography to provide adequate food and cover for wildlife. Topography is relatively flat with a slope of 1-3% with 1-2 inch deep depressions. The area is mapped as wetland and watertable is within 8 inches. The seasonal high water is at the surface. The site is typically around 10 acres. Soils are saturated

**After Situation:**

Area is excavated to create 20 x 40 ponded areas with 10% in pools 6-18 inches deep. Removal of trees to provide access for construction in 20 x 40 ponded areas around 5% of the 10 acres were removed of trees. The soil removed from the ponded areas is used to create mounds for habitat.

**Feature Measure:** Acre of wetland enhancement

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $17,103.69

**Scenario Cost/Unit:** $1,710.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 65 | $5,831.80 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hours | $53.78 | 40 | $2,151.20 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 5 | $1,780.35 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 2.5 | $765.63 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 2.5 | $630.28 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 85 | $4,233.85 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 660 - Tree-Shrub Pruning

**Scenario** #1 - Pruning, Fire Hazard

**Scenario Description:**

Pruning trees of branches in a forest stand where wildfires are considered a high and very high hazard. Hand tools and power tools are used to cut branches from trees. Resource concerns include Degraded plant condition-wildfire hazard and Undesirable plant productivity and health.

Associated Practices: Brush Management (314), Woody Residue Treatment (384), Fuel Break (383), Fire Break (394), Forest Stand Improvement (666)

**Before Situation:**

The forest stand is well to over-stocked, generally with 200 to 300+ trees per acre. Branches are touching understory vegetation or are in close proximity to forest floor where a ground fire can ignite the lower branches and move into the upper canopy. Wildfire hazard is very high.

**After Situation:**

The typical forest pruning treatment is 20 acres. Trees are pruned to the desirable height (generally 8-10') based on desired separation space between ground vegetation and tree crown. Pruned branches are treated if they are a hazard, see Woody Residue Treatment standard.

**Feature Measure:** area of treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $11,279.70

**Scenario Cost/Unit:** $563.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 200 | $1,330.00 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 20 | $371.00 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 20 | $47.00 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 20 | $193.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 240 | $7,732.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 30 | $1,605.30 |

**Practice:** 660 - Tree-Shrub Pruning

**Scenario** #2 - Pruning, Low Height

**Scenario Description:**

Pruning is done by hand with chain saws, tree loppers, hand shears, or hand saws. Trees are identified for pruning. To improve the quality of the stem wood, branches are pruned from the trees. Trees are growing at a fast pace, with leader growth on trees anywhere from 1.5 feet to 4 feet in length. Associated Practices: Brush Management (314), Woody Residue Treatment (384), Forest Stand Improvement (666)

**Before Situation:**

Trees are retaining lower limbs along the entire tree bole, reducing wood quality. Pruning height will be based on overall stand diameter and height. Stand has been thinned and crop trees are identified for pruning. Degraded plant condition- undesirable plant productivity and health is the resource concern.

**After Situation:**

The typical forest pruning treatment is 20 acres. Trees are pruned to the desirable height of 8-10 feet. Pruned branches are treated if they are a fire hazard, see Woody Residue Treatment standard.

**Feature Measure:** area of treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $5,779.49

**Scenario Cost/Unit:** $288.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 96 | $638.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 16 | $37.60 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 8 | $77.44 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 120 | $3,866.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 15 | $802.65 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 20 | $208.60 |

**Practice:** 660 - Tree-Shrub Pruning

**Scenario** #3 - Pruning, High Height

**Scenario Description:**

Pruning is done by hand with pole saws or with gas pole saw. Crop trees are identified for pruning. The forest is on highly productive soils. Trees are growing at a fast pace, with leader growth on trees anywhere from 1.5 feet to 4 feet in length. To improve the quality of the stem wood, branches are pruned from the trees. Associated Practices: Brush Management (314), Woody Residue Treatment (384), Forest Stand Improvement (666)

**Before Situation:**

Trees are retaining limbs mostly along the mid to upper section of the tree bole, reducing quality. Lower branches (0-8 feet) may have already been pruned, have naturally self pruned to differing heights. Pruning height is at least to eighteen (18) feet above the ground. Degrade plant condition- undesirable plant productivity and health is the resource concern.

**After Situation:**

The typical forest pruning treatment is 20 acres. Trees are pruned to the height of 18 feet or more. Pruned branches are treated so they do not become a fire or health hazard.

**Feature Measure:** area of treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $8,163.80

**Scenario Cost/Unit:** $408.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 24 | $159.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 20 | $371.00 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 16 | $37.60 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 120 | $1,161.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 160 | $5,155.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 20 | $208.60 |

**Practice:** 660 - Tree-Shrub Pruning

**Scenario** #4 - Pruning, Wildlife

**Scenario Description:**

Pruning of hard/soft mast trees and shrubs to stimulate increased fruit/nut production for wildlife food. Primarily done around old agricultural fields, in old orchards, in forested areas. Is usually done with a chainsaw or handsaw to open the canopy and remove dead branches to increase airflow and sunlight penetration. Resource concerns are inadequate habitat for fish and wildlife - habitat degrdation and plant condition- undesirable plant productivity and health

Associated Practices: Brush Management (314), Woody Residue Treatment (384), Upland Wildlife Habitat Management

**Before Situation:**

Trees have reduced mast production due to tree reaching maturity or heavy shade. Pruning is needed to remove older branches, dead material and increase sunlight into the canopy. New branching will be stimulated, increasing mast production.

**After Situation:**

Selected trees (10 per acre) are re-invigorated with new branching and an increase in mast production.

**Feature Measure:** area of treatment

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $399.03

**Scenario Cost/Unit:** $199.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 4 | $26.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 2 | $37.10 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 2 | $4.70 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 2 | $19.36 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** 660 - Tree-Shrub Pruning

**Scenario** #5 - Pruning, Multistory Cropping, Understory

**Scenario Description:**

Pruning trees and/or shrubs is accomplished to extend the life span of trees and or shrubs. Pruning reduces the time periods of replacement by 2/3rds, exposing less bare soil. Pruning is accomplished by hand with hand tools and/or chainsaw. Trees and or shrubs are growing where the average rainfall is very high, with cooler temperatures and deep steep soils. Resouce concerns are degraded plant condition-undesireable plant productivity and health, soil erosion-sheet and rill.

**Before Situation:**

Trees and/or shrubs are showing signs of reduced health (thinning crowns/less branching) and fruit production. Loss of trees or shrubs will occur within a few years. Severe soil erosion and sedimentation is a great concern if trees or shrubs are removed.

**After Situation:**

Tree/shrub pruning is completed on trees and/or shrubs. Cut vegetative material is left on the ground providing cover, and increasing organic matter. Alternative row pruning, treating every other row (or one-half the plants), in the same field, is completed 2 times. Renovation pruning is conducted one time for the entire field.

**Feature Measure:** individual tree/shrub pruned

**Scenario Unit:** Each

**Scenario Typical Size:** 800.00

**Scenario Total Cost:** $933.20

**Scenario Cost/Unit:** $1.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 10 | $66.50 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 4 | $9.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |

**Practice:** 660 - Tree-Shrub Pruning

**Scenario** #6 - Pruning, Multistory Cropping, Overstory

**Scenario Description:**

Overstory tree crowns are pruned to increase sunlight to understory shrubs and low growing trees that have been purposely established to grow on the same acre of ground. Resource concern is degraded plant condition - undesirable plant productivity and health.

**Before Situation:**

The overstory trees are expanding their crowns, providing to much shade on the understory plants. The shade is affecting the growth and production of the understory plants. Pruning of branches, leaves, frawns, etc. are needed to maintain the desired amount of sunlight reaching the understory.

**After Situation:**

Pruning of the overstory tree crowns is completed, allowing the proper amount of sunlight to reach the understory vegetation, maintaining their growth, health and vigor, and wildlife benefits.

**Feature Measure:** Overstory Trees Pruned

**Scenario Unit:** Each

**Scenario Typical Size:** 120.00

**Scenario Total Cost:** $1,187.24

**Scenario Cost/Unit:** $9.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 20 | $133.00 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 12 | $28.20 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hours | $9.68 | 4 | $38.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |

**Practice:** 660 - Tree-Shrub Pruning

**Scenario** #26 - Pruning Individual Agroforestry tree - small acreage

**Scenario Description:**

In agroforestry settings (crop or forest lands) overstory tree crowns are pruned to increase sunlight to understory shrubs, low growing trees, and crop plants that have been purposely established to grow on the same ground. Thirty trees or less per acre require pruning. Associated Conservation Practice Standard (CPS) 384 - Woody Residue Treatment. Resource concern is degraded plant condition - undesirable plant productivity and health.

**Before Situation:**

Overstory trees are expanding their crowns, providing too much shade on the understory plants. The shade is affecting the growth and production of the understory plants. Pruning branches, leaves, frawns, etc. are needed to maintain the desired about of sunlight reaching the understory.

**After Situation:**

Pruning of the overstory tree crowns is completed, allowing the proper amount of sunlight to reach the understory vegetation, maintaining their grown, health and vigor, and wildlife benefits. Typical treatment area ranges from less than 1 acre to 5 acres per producer; typical scenario based on 1 ac, 30 TPA.

**Feature Measure:** Tree Pruned

**Scenario Unit:** Each

**Scenario Typical Size:** 30.00

**Scenario Total Cost:** $470.97

**Scenario Cost/Unit:** $15.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 5 | $33.25 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 3 | $7.05 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 5 | $255.80 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 3 | $96.66 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #1 - Thinning Hand Tools with a Consultant

**Scenario Description:**

An over-stocked stand has declining production and health; it also lacks structural and composition diversity. A consulting forester supervises the operation, and is carried out using hand tools such as chain saws. Managing the stand utilizing accepted stocking guidelines improves plant condition, prevents wildlife habitat degradation, and reduces wildfire hazards.

**Before Situation:**

An overstocked, unhealthy forest stand of pole sized trees lacks structural and species diversity. Annual growth rates and vigor are declining due to overstocking of the stand, making it susceptible to insect and disease attack, as well as unacceptable wildfire risk.

**After Situation:**

Thinning adjusts the stand's stocking to an acceptable level to promote stand growth, condition, and improve overall quality. The resultant increased sunlight reaching the forest floor without invasive species composition improves wildlife habitat.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,582.16

**Scenario Cost/Unit:** $458.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 50 | $332.50 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 50 | $2,558.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #2 - Single Stem Chemical Thinning

**Scenario Description:**

Species composition, stand structure, and stocking density are managed by controlling selected trees and understory vegetation. The tree is debarked with an axe or hatchet and the tree is then injected with an herbicide. Due to the ability of target species to propagate via the root system the injected herbicide is critical in order to ensure control of the target species. The snag trees will remain for wildlife habitat. Up to 35% of the forest stand will be treated. Restoration and Management of Declining (643), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Brush Management (314) and Integrated Pest Management (595)

**Before Situation:**

The existing stand consists of unwanted/undesirable species and the stocking rate exceeds the recommended level. Undersirable species consist of hardwoods and shrubs that can propogate via root systems that make commercial control unfeasible.

**After Situation:**

The forest health is managed and improved due to the selective management and chemical treatment of hardwoods and shrubs. Treatment of the hardwoods and shrubs promotes plant health and vigor of the remaining trees, and allows them greater availability to water and nutrients and promotes wildlife habitat. Habitat is created for cavity nesting birds by leaving snags on site.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,107.02

**Scenario Cost/Unit:** $410.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 20 | $1,316.20 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 20 | $47.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 3.5 | $36.51 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 3.5 | $137.27 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #3 - Chemical, Ground

**Scenario Description:**

Removal of target, undesirable species is achieved using ground applied chemicals to release young, desirable tree species competing with overtopping vegetation. Target removal is necessary to promote plant health and vigor and to achieve the appropriate spacing and trees per acre of the desirable species that facilitates plant growth. Removal is supervised to ensure objectives are achieved. Associated Practice(s): Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Integrated Pest Management (595) and Firebreak (394)

**Before Situation:**

An adequately stocked stand of desirable species is not growing to its potential for the site due to severe competition from undesirable trees and brush competing for water and nutrients. Competition inhibits plant health and vigor.

**After Situation:**

The desirable vegetation is released from the competition by ground applying herbicides to the stand as an over-the-top spray. Undesirable vegetation is managed to promote desirable plant health and vigor through reduced competition. The appropriate stocking density and spacing is achieved.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $9,643.88

**Scenario Cost/Unit:** $241.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application, forested land | 1313 | Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs | Acres | $146.47 | 40 | $5,858.80 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 40 | $2,034.40 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 40 | $89.60 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #4 - Chemical, Aerial

**Scenario Description:**

Aerially applied chemicals release the desirable trees from competing and/or overtopping vegetation. Releasing the desirable trees from the competition is achieved through the application of appropriate herbicides according to label directions. Application will be by helicopter as an over-the-top spray. The work will be professionally planned and supervised. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation. Associated Practices: Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Fuel Break (383), Woody Residue Treatment (384), Firebreak (394) and Integrated Pest Management (595).

**Before Situation:**

An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush.

**After Situation:**

The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns. Releasing the desirable trees from the competition will be achieved through the application of appropriate herbicides according to label directions. Application will be by helicopter as an over-the-top spray. The work will be professionally planned and supervised.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $4,792.88

**Scenario Cost/Unit:** $119.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, aerial application, fixed wing | 947 | Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs. | Acres | $10.76 | 40 | $430.40 |
| Chemical, aerial application, helicopter | 1991 | Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor. | Acres | $45.26 | 40 | $1,810.40 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 40 | $2,034.40 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 40 | $89.60 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #6 - Mechanical, Heavy Equipment

**Scenario Description:**

The stocking rate of an unhealthy stand with competing vegetatation is adjusted to an acceptable level using mechanical treatment such as a masticator or mulcher. The competing vegetation is controlled to manage desirable trees and species. Trees are marked by a consultant. Stand health and wildlife habitat is improved and undesirable vegetation is managed. Associated Practices: Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Fuel Break (383), Woody Residue Treatment (384), Firebreak (394) and Integrated Pest Management (595)

**Before Situation:**

An young stand of desirable species is not growing to its potential for the site due to severe competition from undesirable trees and brush competing for water and nutrients. Competition inhibits plant health and vigor. The vegetation to be controlled is too large to be mowed or shredded, requiring larger mechanical methods such as masticators or mulchers.

**After Situation:**

The stocking rate is adjusted to an acceptable level and the competing vegetation is controlled. The stand growth, composition, condition, and overall quality is improved. In addition, wildlife habitat is improved with the increase of sunlight to the forest floor. . Therefore other mechanical methods such as using masticators or mulchers is necessary.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $6,828.34

**Scenario Cost/Unit:** $682.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 30 | $3,216.30 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 30 | $1,020.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 15 | $1,984.20 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #7 - Forest Openings, Low Density

**Scenario Description:**

Two acre patches are created in over-mature or degraded stands using hand tools such as chainsaws. Small openings are created by removing all undesirable trees greater than 2" in diameter. Removal of undesirable trees fosters regeneration of shade-tolerant, desirable species. Early successional wildlife habitat is created promoting forest diversity. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation. Associated Practices: Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Fuel Break (383), Woody Residue Treatment (384), Firebreak (394) and Integrated Pest Management (595)

**Before Situation:**

An overly mature, existing stand has been degraded in value by previous management practices. The stand is stocked with the remaining undesirable species. Wildlife habitat is degraded. The undesirable species are overshadowing the desirable species inhibiting plant health and vigor.

**After Situation:**

A young stand of desirable species is established by removing competing, larger undesirable species. An early successional wildlife habitat is created along side the forest diversity. Small openings are created by removing all trees greater than 2" in diameter. Removal of larger trees fosters regeneration of shade-tolerant, desirable species. Trees are removed using a chainsaw.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $2,039.04

**Scenario Cost/Unit:** $1,019.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 16 | $106.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #9 - Comprehensive Forest Stand Treatment, no chipping

**Scenario Description:**

Trees within a woodlot are managed as part of a Forest Stewardship Plan (or approved equivalent) to create the appropriate stocking density for forest health or wildlife. Overstocked species over 5 inches in diameter are removed with a feller buncher. Over stocked species under 5 inches in diameter are removed using a chainsaw. Woody vegetation and invasive species left by the cuttings that are inhibiting regeneration are removed using an herbicide that can control the woody species. The herbicide is applied via spot treatment. Activities are supervised, trees marked, and reviewed according to the management objectives by a specialist to ensure objectives are being achieved. Resource concerns include: Inadequate structure and composition, Undesirable plant productivity and health, and Habitat degradation. Associated Practices: Restoration and Management of Declining and Rare Habitat (643), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Forest Trails and Landings (655), Brush Management (314), Woody Residue Treatment (384),Prescribed Burning (338), Firebreak (394), Fuel Break (383) and Integrated Pest Management (595).

**Before Situation:**

A 10 acre mature, unhealthy forest contains over-stocked trees lacking diversity in variety and stand age. The woodlot includes undesirable, invasive species inhibiting plant health. Undesirable species do not meet adequate needs of food and cover for targeted wildlife species.

**After Situation:**

Forest health is managed and improved by manipulating the stand density and structure to restore natural/desirable plant communities. An even-aged management system is implemented creating a forest of preferred, native trees and shrubs, and understory species. The stand may vary in tree/shrub spacing, density, and class size. Plant health and vigor is improved. Healthy forest provides suitable food and cover for a variety of small and large mammals, forest interior birds, migratory songbirds, pollinators, reptiles, and amphibians.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $8,245.34

**Scenario Cost/Unit:** $824.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 40 | $266.00 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 20 | $1,316.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 10 | $508.60 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #10 - Forest opening, heavy density

**Scenario Description:**

Early successional habitat opening creation: Cuts should occur from September through March to minimize disturbance to nesting birds. A well stocked pole-timber sized northern hardwood stand has the potential to provide optimal food and habitat for numerous life stages of early successional target wildlife. A professional biologist or forester has flagged out four (4) five (5) acre wildlife openings (clear cuts). Cuts should be in wide blocks. Where possible, forest wildlife openings will be applied no closer than 300 feet from any edge of the forest area. Location of wildlife openings can be adjusted to avoid steep slopes, streams, wetlands, and other environmentally sensitive areas. Tree tops can be loped and left in place.

**Before Situation:**

Young forest dominated by pole-sized timber (4 to 8 inches DBH). Early successional shrub habitat is lacking in the forest block. Forest canopy needs to be opened to stimulate shrub growth in the under story.

**After Situation:**

Minimum 5 acre opening is created. Large mast trees or other species valuable to wildlife may be retained at a rate of 10 to 12 trees per acre. Wildlife habitat is improved with the increase of sunlight to the forest floor.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $7,854.41

**Scenario Cost/Unit:** $1,570.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Feller buncher | 941 | Equipment and power unit costs. Labor not included. | Hours | $153.24 | 30 | $4,597.20 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 30 | $1,494.30 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 15 | $802.65 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #11 - Wildlife selective tree felling

**Scenario Description:**

Selective tree felling calls for cutting with chainsaw large trees that are scattered throughout shrubs in order to maintain canopy opening and sunlight penetration to shrub layer . Stock is typically >4" dbh or 20' tall. Leave about 10 to 12 wildlife reserve trees per acre and all shagbark hickory. Trees can be cut and left or removed. Only cut while dormant. Can be used to regenerate aspen. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Wetland Wildlife Habitat Management (644), Brush Management (314), Forest Slash Treatment (384) and Integrated Pest Management (595).

**Before Situation:**

Tree canopy beginning to close and shade out shrub land habitat, reducing wildlife value for early successional species.

**After Situation:**

Large trees removed to an acceptable level to promote shrub land habitat, improving wildlife habitat with the resulting increase of sunlight reaching the forest floor.

**Feature Measure:** Area treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $1,817.09

**Scenario Cost/Unit:** $363.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8.5 | $56.53 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8.5 | $434.86 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8.5 | $273.87 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 5 | $52.15 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #38 - Basal Stem Treatment

**Scenario Description:**

Interfering understory vegetation, which is to large to effectively control with foliar herbicides, is treated with herbicides applied into or on the bark of targeted undesirable woody plants. This treatment is intended to be utilized in forest stands up to ten years prior to a regenerating timber harvest.

**Before Situation:**

Interfering vegetation in the forest understory pose a threat to the stand's long-term productivity, health, and future structure and composition. Some of these undersirable species can propogate via root systems that make mechanical control ineffective.

**After Situation:**

Due to the selective management and chemical treatment of undesirable trees and shrubs, the residual forest health and productivity is improved, the stand structure and composition is corrected, and desirable wildlife habitat is capable of establishing.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,347.40

**Scenario Cost/Unit:** $434.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 40 | $2,632.40 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 10 | $392.20 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #40 - Thinning with Hand Tools without a Consultant

**Scenario Description:**

An over-stocked stand has declining production and health; it also lacks structural and composition diversity. A professional state or local forester supervises the operation, which is carried out using hand tools such as chain saws. Managing the stand utilizing accepted stocking guidelines improves plant condition, prevents wildlife habitat degradation, and reduces wildfire hazards.

**Before Situation:**

The stocking rate of a pole sized forest stand is too high to ensure forest health. Stand also lacks species diversity.

**After Situation:**

Managing stand stocking has improved plant productivity and health, prevented wildlife habitat degradation, reduced wildlife hazards and provided adequate structure and composition.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $2,890.50

**Scenario Cost/Unit:** $289.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 50 | $332.50 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 50 | $2,558.00 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #43 - Wildlife Crop Tree Release

**Scenario Description:**

This stand treatment manually cuts (chainsaw) all competing woody vegetation from at least three sides of individual "Crop Trees" (E, W, & S sides) at a minimum distance from the stump of one and a half times the stand's average height and not to exceed three times the stand's average height. Utilize Woody Residue Treatment (384) to properly reduce the resulting slash created from releasing crop trees as necessary. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

**Before Situation:**

Valuable soft or hard mast producing trees or shrubs have been found in a forest stand, but are need of treatment due to over-topping from adjacent faster growing trees. The landowner's objective is to management area for wildlife habitat. Resource Concern: INADEQUATE HABITAT FOR FISH AND WILDLIFE – Habitat degradation.

**After Situation:**

Mast producing trees are released, improving wildlife habitat.

**Feature Measure:** Acres Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $664.20

**Scenario Cost/Unit:** $664.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8 | $53.20 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #47 - Shelterwood Cut

**Scenario Description:**

The purpose of this treatment is to increase understory light levels so that small advanced reproduction (already present) can grow and will be large enough to compete effectively following overstory removal. This treatment will prepare the stand for an eventual overstory removal. All undesirable understory and midstory vegetation should be cut. Reduce relative density to 40-60%, depending on the size of the advanced reproduction and desired species (density reduction at the discretion of forester). Removals should be focused on seed source trees of undesirable species, all suppressed and intermediate trees, and some co-dominant trees. Retain trees with large, healthy crowns to produce seed and to moderate the ground-level environment. Where possible, cuts should not occur from April through October to minimize disturbance to roosting Indiana Bats and nesting birds. Associated Practices: Restoration and Management of Declining and Rare Habitat(643), Upland Wildlife Habitat Management (645), Herbaceous Weed Control (315), Brush Management (314).

**Before Situation:**

Adequate numbers of established advanced reproduction are present, but midstory and overstory shade is limiting its development. Either desirable reproduction is too small, or the likelihood of competition is too great to allow for a final (overstory) removal cut.

**After Situation:**

Minimum of 10 ac. is treated. Understory light levels are enhanced to promote growth of advanced reproduction to competitive sizes.

**Feature Measure:** Size of treated Area

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $6,676.18

**Scenario Cost/Unit:** $667.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 40 | $266.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 20 | $644.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 25 | $3,307.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #59 - Light Equipment, Mechanical Treatment

**Scenario Description:**

Light equipment such as a tractor with a brush mower is used to control vegetation that competes with desirable trees and/or reduces the acceptable stocking level of desirable trees. The vegetation to be controlled is small enough to be mowed or shredded. The work can be done by mowing or shredding strips through the stand, mowing between planted tree rows, etc. Resource concerns include: Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition, and Wildfire Hazard, Excessive Biomass Accumulation; Soil Erosion - Concentrated flow erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

**Before Situation:**

A stand of young, desirable trees is adversely affected by competition either from undesirable species or because the stand is overstocked. Without treatment the desirable trees may not survive, and impacts on forest health and wildlife habitat may occur. Soil erosion may occur beneath a dense thicket of brush that shades out understory vegetation.

**After Situation:**

After management, stocking level is at an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. Habitat for certain wildlife species is improved by the development of understory vegetation stimulated by the increase in sunlight. Understory vegetation holds soil in and limits erosion. Trees are healthy and less susceptible to damaging levels of insect pests and diseases. The risk from catastrophic wild-land fire is reduced and other resource concerns are addressed.

**Feature Measure:** Area Treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $491.96

**Scenario Cost/Unit:** $49.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acres | $21.58 | 10 | $215.80 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #77 - Thinning for Wildlife and Forest Health

**Scenario Description:**

Management to partially open a forest canopy to facilitate development of understory and midstory vegetation, and create conditions more favorable for desired wildlife species and tree health. A forester marks trees to be felled and/or treated. Treatment requires skilled labor using chainsaws and other hand tools, and chemical applications. Costs involved in any commercial harvest operation, including access and transportation costs, are not included in this scenario. Costs involved in marking trees to be treated, and supervising the treatment work, are included. Resource concerns include: - Inadequate structure and composition; - Undesirable plant productivity and health; and - Wildlife habitat degradation.

**Before Situation:**

The stand of mature trees is excessively dense, resulting in a closed canopy. The forest lacks midstory and horizontal structure, the herbaceous layer is lacking or in poor condition, and/or the desired and characteristic plant diversity for the eco-site is not present. Without management, the site will not reach the desired future condition and meet landowners' objectives for wildlife habitat and forest health.

**After Situation:**

After management, stand density, structure and composition are at an acceptable level. The canopy is opened to the extent necessary to promote herbaceous growth and mid-canopy development. Air movement, and understory plant growth, condition and quality are improved. Habitat for wildlife is improved. Stand density enhances eco-site diversity, Trees are healthy and less susceptible to damaging levels of insect pests and diseases.

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $7,048.29

**Scenario Cost/Unit:** $704.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 40 | $266.00 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 40 | $2,632.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 5 | $92.75 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 5 | $52.15 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 5 | $11.20 |
| Herbicide, Triazine | 1321 | Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $91.09 | 5 | $455.45 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario** #2 - Lighting - LED

**Scenario Description:**

To install dimmable LEDs to replace incandescent lamps on a one-for-one basis. Light fixtures do not have to be replaced. A typical poultry house has 48 fixtures. LED requirements: minimum 6 Watt, 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketted or weatherproof housings are required to prevent corrosion and premature failure.

**Before Situation:**

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

**After Situation:**

More efficient lighting is provided by Light-Emitting Diode (LED) lamps in order to reduce energy use as evidenced by the energy audit.Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each lamp replaced

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $13.01

**Scenario Cost/Unit:** $13.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 0.17 | $5.48 |
| **Materials** | | | | | | |
| Lighting, bulb, LED, dimmable, minimum 450 lumens | 1167 | Light Emitting Diode (LED), typically 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. Materials only. | Each | $7.53 | 1 | $7.53 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario** #3 - Lighting-High Bay LED

**Scenario Description:**

The lighting system consists of a 150 watt light emitting diode (LED), typically 5,000 Kelvin bulb, 14,000 lumens, with industrial grade fixture typically used to replace a Metal Halide (PSMH) lamp or four to eight lamp fluorescent fixtures in high bay locations. This or equal or better shall be detailed in ASABE S612-compliant energy audit). Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required. If lighting controls are needed, add Controller-Automatic as a seperate line item.

**Before Situation:**

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

**After Situation:**

More efficient lighting is provided by Light-Emitting Diode (LED) lamps in order to reduce energy use as evidenced by the energy audit.Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each fixture

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $315.51

**Scenario Cost/Unit:** $315.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| **Materials** | | | | | | |
| Lighting, Fixture, High Bay, LED, 24,000 lumens, Damp Location | 2602 | LED High Bay Fixture, typically 5000 Kelvin bulb, 24,000 lumens; industrial grade with fixture; suitably protected from dirt accumulation, and damp locations. Minimum lifespan of 50,000 hours. Includes materials only. | Each | $213.19 | 1 | $213.19 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario** #4 - Lighting - Linear Fluorescent

**Scenario Description:**

The lighting system consists of a four-foot, three-lamp fixture with a single electronic ballast. The high-efficiency lighting system uses high-efficiency 66 watt led linear fixtures. Associated materials for installation of replacement or retro fit of fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required. If lighting controls are needed, add Controller-Automatic as a separate line item.

**Before Situation:**

Inefficient lighting (such as incandescent or T12 fluorescent tubes driven by magnetic ballasts) as evidenced by an on-farm energy audit.

**After Situation:**

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each fixture replaced or retro fixed

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $367.33

**Scenario Cost/Unit:** $367.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| **Materials** | | | | | | |
| Lighting, Fixture, LED, min. 6,000 Lumens, wet location rated. | 2627 | Lighting fixture with 4 linear Light Emitting Diode (LED) lamps (4 foot tall) with a minimum of 6,000 lumens per fixture. Minimum of 50,000 hour lifespan. Includes materials and shipping only. | Each | $316.17 | 1 | $316.17 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario** #6 - Automatic Controller System

**Scenario Description:**

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

**Before Situation:**

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

**After Situation:**

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each system

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $560.81

**Scenario Cost/Unit:** $560.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| **Materials** | | | | | | |
| Programable LED Dimmer | 2720 | Programable light dimmer/controller for poultry and hog barns - Includes material and shipping only | Each | $356.17 | 1 | $356.17 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario** #18 - Lighting, Dairy Complex

**Scenario Description:**

The typical dairy facility areas needing lighting improvement requires 65% of the area to meet 150 Lux at <=.55 CV, 25% of the area to meet 200 Lux at <= .45 CV, and 10% of the area to meet 500 Lux at <=.25 CV. High Bay fixtures are installed in areas needing 200 or 500 lux with linear fluorescent or better being installed in areas needing 150 Lux. Lighting meets the Lux and CV recommendations found in ASAE EP 344 Jan 2005. Fixture recommendations from a commercial lighting fixture vendor. Lighting system consist of four foot, four lamp fixtures 66 watt LED for low ceilings and High Bay LED, 150 watt fixtures for higher ceilings. Fixtures rated wet location in parlor, holding area, etc. as appropriate with all others damp rated. Most facilities will add fixtures to get required lighting. Payment does not include additional costs of new wiring, nor is a separate payment allowed.

**Before Situation:**

An inefficient lighting system was identified for a specific areas of a dairy complex as per an on-farm, Type 2 Energy Audit recommending upgrades.

**After Situation:**

Upon completion of the project sufficient lighting is installed covering 50,000 SF of a dairy complex that meets the guidelines of ASAE EP 344. The area requirements are as follows: 32,500 SF requires 150 Lux, 12,500 SF requires 200 Lux and 5,000 SF requires 500 Lux. Existing fixtures were upgraded to efficient lighting criteria and additional ones are added to meet lighting requirements. High bay fixtures are used in areas requiring either 200 ( 1 fixture / 505 SF)or 500 Lux ( 1 fixture /208 SF)and linear LED fixtures are used in areas needing 150 Lux ( 1 fixture / 544 SF). Payment is based on the SF of area meeting the lighting criteria and includes the cost of the fixture and connection to existing wiring. No additional payment will be made for new wiring needed when additional fixtures are required.

**Feature Measure:** Square feet of area being lighted

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 50,000.00

**Scenario Total Cost:** $34,890.63

**Scenario Cost/Unit:** $0.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 107 | $5,474.12 |
| **Materials** | | | | | | |
| Lighting, Fixture, High Bay, LED, 24,000 lumens, Damp Location | 2602 | LED High Bay Fixture, typically 5000 Kelvin bulb, 24,000 lumens; industrial grade with fixture; suitably protected from dirt accumulation, and damp locations. Minimum lifespan of 50,000 hours. Includes materials only. | Each | $213.19 | 49 | $10,446.31 |
| Lighting, Fixture, LED, min. 6,000 Lumens, wet location rated. | 2627 | Lighting fixture with 4 linear Light Emitting Diode (LED) lamps (4 foot tall) with a minimum of 6,000 lumens per fixture. Minimum of 50,000 hour lifespan. Includes materials and shipping only. | Each | $316.17 | 60 | $18,970.20 |

**Practice:** 670 - Energy Efficient Lighting System

**Scenario** #36 - Lighting - Linear LED

**Scenario Description:**

The lighting system consists of a LED linear fixture with light. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required.

**Before Situation:**

Inefficient lighting (such as incandescent or T12 fluorescent tubes driven by magnetic ballasts) as evidenced by an on-farm energy audit.

**After Situation:**

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each fixture replaced

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $191.02

**Scenario Cost/Unit:** $191.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| **Materials** | | | | | | |
| Lighting, Exterior Fixture with LED, Min. 5,000 Lumens, IP65 Rated | 2704 | LED Lighting fixture with a minimum of 5,000 lumens for exterior/outdoor uses such as buildings, doorway, or pathways. Includes light and fixture. All materials and appurtenances included. | Each | $139.86 | 1 | $139.86 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario** #1 - Building Envelope - Attic Insulation

**Scenario Description:**

Install a minimum of R-7 insulation in addition to existing attic or ceiling to reduce heat transfer. Increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

**Before Situation:**

A poultry house with an inefficient building envelope with limited attic insulation.

**After Situation:**

A more effective and efficient building envelope can be created through addition of, or increased, attic insulation. Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Area of Attic Insulated

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 20,000.00

**Scenario Total Cost:** $26,800.00

**Scenario Cost/Unit:** $1.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Insulation, Fiberglass or cellulose, R-15 | 1196 | Fiberglass or cellulose insulation R-15, includes materials, equipment and labor to install. | Square Feet | $1.34 | 20000 | $26,800.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario** #2 - Building Envelope - Wall Insulation

**Scenario Description:**

Enclose both sidewalls and endwalls from ceiling to floor in one of two manners: 1) metal exterior, 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing, or 2) closed-cell polyurethane foam application (minimum 1" thickness (R-7) of 2.5 lbs/cu.ft. or higher density, (3.0 or higher density preferred) with a form of physical protective barrier on lower 2' (may be 6 lbs/cu.ft. or higher density 1/8" thick foam, or treated lumber). Based on a 40' x 400' poultry house.

**Before Situation:**

A poultry house with an inefficient building envelope with limited wall insulation.

**After Situation:**

A more effective and efficient building envelope can be created through addition of, or increased, insulation. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Area of Attic Insulated

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $13,410.00

**Scenario Cost/Unit:** $2.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Insulation, Panel, R-11 with sheathing | 1197 | Insulated wall panel typically 3.5 inch fiberglass batts (R-11), vapor barrier and OSB sheathing, or equal, includes materials, equipment and labor to install. | Square Feet | $2.98 | 4500 | $13,410.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario** #3 - Building Envelope - Sealant

**Scenario Description:**

A typical scenario is sealing the gaps between walls, gables, ceiling, etc. in a poultry house or greenhouse. Sealing is performed by a professional contractor, not merely use of spray foam from a can. The unit basis of payment in this scenario is each house based on 60' x 500' poultry house with an assumed need of sealant to seal 2400 linear feet of gap.

**Before Situation:**

An agricultural facility with an inefficient building envelope with gaps between walls, ceiling, etc. for a total of 2400 linear feet.

**After Situation:**

A more effective and efficient building envelope can be created through interior sealing of the exterior walls at the footer plate, eaves, ridge cap, and gable ends. The sealant reduces seasonal heat loss and heat gain due to infiltration which reduces the respective need for heating and cooling equipment to operate. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Perimeter of heated structure

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,400.00

**Scenario Total Cost:** $5,808.00

**Scenario Cost/Unit:** $2.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Sealant | 1150 | Greenhouse and building gap sealant. Performed by a professional contractor spraying the areas with an approved sealant for poultry production facilities. Includes materials, equipment and labor to install. | Feet | $2.42 | 2400 | $5,808.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario** #4 - Building Envelope - Greenhouse Screens

**Scenario Description:**

The mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven strips of aluminum fiber, polyethylene, nylon or other synthetic material. The screen provides a means to better control solar heat gain and heat transfer during night or cold weather conditions to reduce energy use. Screens and similar devices may also be used to divide internal areas and allow for differentiated heating, ventilation, or cooling system operation to reduce energy use.

**Before Situation:**

Heating and cooling of an existing greenhouse, or similar structure with conditioned spaces, is inefficient due to poorly regulated heat transfer. A need to regulate an entire space for uniform conditions when some portions have differing, intermittent requirements can also reduce efficiency.

**After Situation:**

The greenhouse is fitted with a mechanically controlled energy screen installed truss-to-truss or gutter-to-gutter, with side screens as necessary, reducing heat loss in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Area of Screen

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 25,000.00

**Scenario Total Cost:** $78,318.56

**Scenario Cost/Unit:** $3.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Thermal blanket 10,001 - 50,000 square foot | 1148 | Thermal blanket greenhouse screens: mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven. Size Range is 10,001 to 50,000 square feet. Materials only. | Square Feet | $3.10 | 25000 | $77,500.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario** #5 - Greenhouse - Insulate Unglazed Walls

**Scenario Description:**

A typical scenario is the installation insulation in green house to address energy loss. The insulation can be either of the cellouse or bubble type (or equivalent). The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

**Before Situation:**

Green house with standard glazing, plastic or polycarbonate walls and no insulation. Heating and cooling of an existing greenhouse is inefficient due to excessive heat loss.

**After Situation:**

The greenhouse is fitted with insulation installed truss-to-truss or gutter-to-gutter and/or non glazed endwalls and/or sidewalls, reducing heat loss and gain in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Square Feet of insulation

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 25,000.00

**Scenario Total Cost:** $10,068.56

**Scenario Cost/Unit:** $0.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Insulation, Greenhouse, Reflective Bubble | 2410 | Double bubble reflective insulation with aluminum foil on both sides. Includes materials and shipping only. | Square Feet | $0.37 | 25000 | $9,250.00 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario** #6 - Spray Foam Insulation

**Scenario Description:**

Spray foam insulation is installed to the thickness to the appropriate R value in the walls and the ceilings of a walk-in refrigeration unit. Insulation standards are set by the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) for walk-in coolers. Only coolers used to support on-farm production and storage can be insulated. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612. Payment is based on 1” of insulation material at R-7 value. Additional inches may be required to meet R-25.

**Before Situation:**

A walk-in refrigeration unit does not meet the minimum insulation value and results in air leaks and energy inefficiency.

**After Situation:**

An application of 1 inch of closed-cell spray foam insulation is installed with a value of R-7. Additional applications of spray foam insulation may be needed to achieve R-25 value, which is the minimum insulation value from ASHRAE standards. The typical application is for a walk-in refrigeration unit 116 feet long by 62 feet wide and 20 feet high. The spray foam insulation is installed on both the walls and ceilings to prevent air leaks and increase energy efficiency. Local building code may require a thermal and/or ignition barrier for all exposed applications. Ceiling applications in climate zones 5 or higher need to address moisture concerns.

**Feature Measure:** Square foot of surface area of walls

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 14,312.00

**Scenario Total Cost:** $49,805.76

**Scenario Cost/Unit:** $3.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Insulation, polyurethane, R-7, with sheathing skirt | 1198 | Closed-cell polyurethane foam insulation (minimum 1 inch thickness (R-7) with a protective sheeting barrier on lower 2 feet of wall height. Includes materials, equipment and labor to install. | Square Feet | $3.48 | 14312 | $49,805.76 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario** #70 - Wall Insulation Only

**Scenario Description:**

Increase insulation value to R-15 by adding insulation to side walls. Based on a 40' x 400' poultry house with 40 feet of cooling pad per house per side. Square footage does not include vents, fans, or door areas.

**Before Situation:**

A poultry house with an inefficient building envelope with limited wall insulation.

**After Situation:**

A more effective and efficient building envelope can be created through addition of, or increased, insulation. Associated practices/activities: may include 128-AgEMP and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Area of Wall Insulated

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 2,642.00

**Scenario Total Cost:** $3,540.28

**Scenario Cost/Unit:** $1.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Insulation, Fiberglass or cellulose, R-15 | 1196 | Fiberglass or cellulose insulation R-15, includes materials, equipment and labor to install. | Square Feet | $1.34 | 2642 | $3,540.28 |

**Practice:** 672 - Energy Efficient Building Envelope

**Scenario** #82 - Building Envelope - Wall Enclosure and Insulation

**Scenario Description:**

Enclose both sidewalls and endwalls from ceiling to floor by removing existing poultry house curtains, installing a metal exterior and:insulating with: (1) 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing, OR (2) closed-cell polyurethane foam application (minimum 1" thickness (R-7) of 2.5 lbs/cu.ft. or higher density, (3.0 or higher density preferred) with a form of physical protective barrier on lower 2' (may be 6 lbs/cu.ft. or higher density 1/8" thick foam, or treated lumber). Based on a 40' x 400' poultry house.

**Before Situation:**

A poultry house with an inefficient building envelope including existing curtains and limited wall insulation. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency.

**After Situation:**

A more effective and efficient building envelope can be created through addition of metal exterior and adding, or increasing, insulation. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Area of Wall Insulated

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 4,500.00

**Scenario Total Cost:** $13,819.28

**Scenario Cost/Unit:** $3.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Insulation, Panel, R-11 with sheathing | 1197 | Insulated wall panel typically 3.5 inch fiberglass batts (R-11), vapor barrier and OSB sheathing, or equal, includes materials, equipment and labor to install. | Square Feet | $2.98 | 4500 | $13,410.00 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #9 - Compost - Off Site

**Scenario Description:**

Apply compost to improve soil biology and other soil health-related resource concerns. Compost has been tested and is imported from an outside source. Compost is applied at the recommended rate to treat the identified resource concerns.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist.

**After Situation:**

Compost was applied at the recommended rate. Soil health resource concerns were treated. A follow up follow up assessment is planned to determine the effect of the compost application.

**Feature Measure:** Cubic Yards of Amendment per Acr

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 6.00

**Scenario Total Cost:** $13,576.58

**Scenario Cost/Unit:** $2,262.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 20 | $264.20 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 0.5 | $61.44 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 3 | $128.64 |
| Biochar | 2743 | Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only. | Cubic Yards | $163.26 | 80 | $13,060.80 |
| **Mobilization** | | | | | | |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.41 | 150 | $61.50 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #10 - Compost - On Site

**Scenario Description:**

Apply compost to improve soil biology and other soil health-related resource concerns. Compost produced in a compost facility on farm has been tested. Compost is applied at the recommended rate to treat the identified resource concerns.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist. A compost facility has been recently installed.

**After Situation:**

Compost was applied at the recommended rate. Soil health resource concerns were treated. A follow up follow up assessment is planned to determine the effect of the compost application.

**Feature Measure:** Cubic Yards of Amendment per Acr

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 6.00

**Scenario Total Cost:** $2,147.09

**Scenario Cost/Unit:** $357.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 10 | $132.10 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 20 | $402.60 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 0.5 | $61.44 |
| Ripper or subsoiler, > 36 inch depth | 1236 | Deep ripper or subsoiler, (>36 inches depth) includes tillage implement, power unit and labor. | Acres | $62.10 | 10 | $621.00 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 10 | $340.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #11 - 100% Biochar

**Scenario Description:**

Apply 100% biochar to sequester carbon, reduce nitrogen losses, and improve other soil health-related resource concerns. Biochar has been tested, and is imported from an outside source. Biochar is applied at the recommended rate to treat the identified resource concerns.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist.

**After Situation:**

Biochar was applied at the recommended rate and proportion. Soil health resource concerns were treated. A follow up assessment is planned to determine the effect of the biochar application.

**Feature Measure:** Cubic Yards of Amendment per Acr

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $858.63

**Scenario Cost/Unit:** $214.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 0.5 | $61.44 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| **Materials** | | | | | | |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 1 | $57.72 |
| Biochar | 2743 | Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only. | Cubic Yards | $163.26 | 4 | $653.04 |
| **Mobilization** | | | | | | |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.41 | 100 | $41.00 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #12 - 40% Biochar-60% Compost

**Scenario Description:**

Apply a blend of >= 40% biochar and <= 60% compost (by volume) to sequester carbon, reduce nitrogen losses, and improve other soil health-related resource concerns. Biochar and compost has been tested, and is imported from an outside source. The blend contains at least 40% biochar and is applied at the recommended rate to treat the identified resource concerns.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist.

**After Situation:**

A blend of >= 40% biochar and <= 60% compost was applied at the recommended rate and ratio. Soil health resource concerns were treated. A follow up assessment is planned to determine the effect of the biochar application.

**Feature Measure:** Cubic Yards of Amendment per Acr

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $479.77

**Scenario Cost/Unit:** $119.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 0.5 | $61.44 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 2.4 | $102.91 |
| Biochar | 2743 | Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only. | Cubic Yards | $163.26 | 1.6 | $261.22 |
| **Mobilization** | | | | | | |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.41 | 100 | $41.00 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #13 - 60% Biochar-40% Compost

**Scenario Description:**

Apply a blend of >=60% biochar and <=40% compost (by volume) to sequester carbon, reduce nitrogen losses, and improve other soil health-related resource concerns. Biochar and compost has been tested, and is imported from an outside source. The blend contains at least 60% biochar and is applied at the recommended rate to treat the identified resource concerns.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist.

**After Situation:**

A blend of >= 60% biochar and <= 40% compost was applied at the recommended rate and ratio. Soil health resource concerns were treated. A follow up assessment is planned to determine the effect of the biochar application.

**Feature Measure:** Cubic Yards of Amendment per Acr

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $633.80

**Scenario Cost/Unit:** $158.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 0.5 | $61.44 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 1.6 | $68.61 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $57.72 | 1 | $57.72 |
| Biochar | 2743 | Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only. | Cubic Yards | $163.26 | 2.4 | $391.82 |
| **Mobilization** | | | | | | |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.41 | 100 | $41.00 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #15 - 80% Biochar-20% Compost

**Scenario Description:**

Apply a blend of >= 80% biochar and <= 20% compost (by volume) to sequester carbon, reduce nitrogen losses, and improve other soil health-related resource concerns. Biochar and compost has been tested, and is imported from an outside source. The blend contains at least 80% biochar and is applied at the recommended rate to treat the identified resource concerns.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist.

**After Situation:**

A blend of >= 80% biochar and <= 20% compost was applied at the recommended rate and ratio. Soil health resource concerns were treated. A follow up assessment is planned to determine the effect of the biochar application.

**Feature Measure:** Cubic Yards of Amendment per Acr

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $912.99

**Scenario Cost/Unit:** $228.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 0.5 | $61.44 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 0.4 | $17.15 |
| Biochar | 2743 | Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only. | Cubic Yards | $163.26 | 3.2 | $522.43 |
| **Mobilization** | | | | | | |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.41 | 100 | $41.00 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #69 - 20% Biochar-80% Compost

**Scenario Description:**

Apply a blend of >= 20% biochar and <= 80% compost (by volume) to sequester carbon, reduce nitrogen losses, and improve other soil health-related resource concerns. Biochar and compost has been tested, and is imported from an outside source. The blend contains at least 20% biochar and is applied at the recommended rate to treat the identified resource concerns.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist.

**After Situation:**

A blend of >= 20% biochar and <= 80% compost was applied at the recommended rate and ratio. Soil health resource concerns were treated. A follow up assessment is planned to determine the effect of the biochar application.

**Feature Measure:** Cubic Yards of Amendment per Acr

**Scenario Unit:** Cubic Yards

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $383.47

**Scenario Cost/Unit:** $95.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 0.5 | $61.44 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 3.2 | $137.22 |
| Biochar | 2743 | Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only. | Cubic Yards | $163.26 | 0.8 | $130.61 |
| **Mobilization** | | | | | | |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.41 | 100 | $41.00 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #70 - Compost - Small Areas

**Scenario Description:**

Apply compost to improve soil biology and other soil health-related resource concerns. Compost has been tested and is imported from an outside source. Compost is applied at the recommended rate to treat the identified resource concerns. This scenario is used for situations where manual labor is typically used to apply or incorporate compost amendments.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist.

**After Situation:**

Compost was applied at the recommended rate. Soil health resource concerns were treated. A follow up follow up assessment is planned to determine the effect of the compost application.

**Feature Measure:** Cubic Feet of Amendment per 100

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $5,258.15

**Scenario Cost/Unit:** $32.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 20 | $264.20 |
| Manure, compost, application | 955 | Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Hours | $122.87 | 4 | $491.48 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 3 | $128.64 |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |
| Biochar | 2743 | Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only. | Cubic Yards | $163.26 | 12 | $1,959.12 |
| **Mobilization** | | | | | | |
| Aggregate, Shipping, Cubic Yard-mile | 2360 | Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul). | Cubic Yard Mile | $0.41 | 4500 | $1,845.00 |

**Practice:** 808 - Soil Carbon Amendment

**Scenario** #119 - Compost + Biochar - Small Areas

**Scenario Description:**

Apply a blend of >= 50% biochar and <= 50% compost (by volume) to sequester carbon, reduce nitrogen losses, and improve other soil health-related resource concerns. Biochar and compost has been tested, and is imported from an outside source. The blend contains at least 50% biochar and is applied at the recommended rate to treat the identified resource concerns.

**Before Situation:**

An appropriate assessment tool is used to determine that soil health resource concerns exist.

**After Situation:**

A blend of >= 50% biochar and <= 50% compost was applied at the recommended rate and ratio. Soil health resource concerns were treated. A follow up assessment is planned to determine the effect of the biochar application.

**Feature Measure:** Cubic Feet of Amendment per 100

**Scenario Unit:** Cubic Feet

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $994.25

**Scenario Cost/Unit:** $12.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 1.5 | $64.32 |
| Biochar | 2743 | Solid material obtained from thermochemical conversion of biomass in an oxygen-limited environment (pyrolysis). Biochar is typically produced from woody biomass, but other carbon sources may be used. Materials only. | Cubic Yards | $163.26 | 3 | $489.78 |

**Practice:** 810 - Annual Forages for Grazing Systems

**Scenario** #7 - Annual forages mix

**Scenario Description:**

Seeding crop, pasture or grazing land to multi-species mix of annual grasses, legumes, forbs or similar species. This mix will address all the planned purposes of the Annual Forages for Grazing Systems (810) standard. Plant forage immediately after harvest of a row crop, small grain, or other forage. Seeding equipment typically used is available on-site. When applicable, terminate the annual forage using an approved method prior to planting a subsequent crop per the NRCS Cover Crop Termination.

**Before Situation:**

Existing forage stands do not meet the forage demands and or quality for grazing animals, particularly during periods of low forage production. Resource concerns include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion, and soil quality. In cases where poor quality or low yields exist in current annual pasture, annual forages replace the existing undesirable forage species and provides temporary forage and erosion control. This payment scenario is based on the no-till drilling of annual forages with no chemical applications.

**After Situation:**

Established annual forage mix improved livestock nutrition through improved forage quality and quantity, reduced erosion and improved soil condition. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping or pasture system.

**Feature Measure:** acres of annual forages planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $1,912.40

**Scenario Cost/Unit:** $95.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 20 | $445.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** 812 - Raised Bed

**Scenario** #16 - Framed Raised Bed Small Lot Contamination or Debris Sites only

**Scenario Description:**

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed 4ft x 16 ft less than or equal to 100 sq ft. Field size 0.10 Acres or less.

**Before Situation:**

Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

**After Situation:**

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

**Feature Measure:** sq ft

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 64.00

**Scenario Total Cost:** $1,003.27

**Scenario Cost/Unit:** $15.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 3 | $10.89 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 9 | $18.99 |
| Lumber, planks, posts and timbers, untreated, rot resistant | 1612 | Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.59 | 108 | $495.72 |
| Steel, Structural Braces and Supports | 2497 | Structural steel in various sizes and shapes. Includes materials and shipping only. | Pound | $1.37 | 2 | $2.74 |
| Earthfill Material, purchased, topsoil | 2745 | Purchased topsoil or screened loam. Material only. | Cubic Yards | $30.67 | 3 | $92.01 |

**Practice:** 812 - Raised Bed

**Scenario** #17 - Unframed Raised Bed field size < 0.10 acres Contamination or Debris Sites only

**Scenario Description:**

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed is 4ft x 16 ft and minimum 16 inches deep and less than 100 sq ft. Field size 0.10 Acres (4356 sq ft ) or less.

**Before Situation:**

Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

**After Situation:**

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

**Feature Measure:** square feet of bed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 85.00

**Scenario Total Cost:** $511.14

**Scenario Cost/Unit:** $6.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 3 | $10.89 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 12 | $25.32 |
| Earthfill Material, purchased, topsoil | 2745 | Purchased topsoil or screened loam. Material only. | Cubic Yards | $30.67 | 3 | $92.01 |

**Practice:** 812 - Raised Bed

**Scenario** #48 - Unframed Raised Bedfield size < 0.5 acres Contamination or Debris Sites only

**Scenario Description:**

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Bed area is 100 to 500 square feet. Raised bed size and shape varies. Field size up to 0.5 acres. NOT TO BE USED FOR RIDGE TILLAGE.

**Before Situation:**

Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

**After Situation:**

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

**Feature Measure:** square feet per bed

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $1,363.46

**Scenario Cost/Unit:** $4.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 22 | $79.86 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 46 | $97.06 |
| Earthfill Material, purchased, topsoil | 2745 | Purchased topsoil or screened loam. Material only. | Cubic Yards | $30.67 | 22 | $674.74 |

**Practice:** 812 - Raised Bed

**Scenario** #49 - Framed Raised Bed < 500 sq ft Contamination or Debris Sites only

**Scenario Description:**

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed ranges from100 square feet to 500 square feet. Field size 0.10 Acres or less.

**Before Situation:**

Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

**After Situation:**

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

**Feature Measure:** sq ft

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $1,714.12

**Scenario Cost/Unit:** $8.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 10 | $36.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 22 | $46.42 |
| Lumber, planks, posts and timbers, untreated, rot resistant | 1612 | Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.59 | 160 | $734.40 |
| Steel, Structural Braces and Supports | 2497 | Structural steel in various sizes and shapes. Includes materials and shipping only. | Pound | $1.37 | 2 | $2.74 |
| Earthfill Material, purchased, topsoil | 2745 | Purchased topsoil or screened loam. Material only. | Cubic Yards | $30.67 | 10 | $306.70 |

**Practice:** 812 - Raised Bed

**Scenario** #50 - Framed Raised Bed greater than or equal to 500 sq ft Contamination or Debris Sites only

**Scenario Description:**

The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed ranges from 500 square feet to 2000 square feet. Scenario assumes 16*50 ft bed size.

**Before Situation:**

Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

**After Situation:**

Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

**Feature Measure:** sq ft

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 800.00

**Scenario Total Cost:** $4,035.44

**Scenario Cost/Unit:** $5.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yards | $3.63 | 40 | $145.20 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| **Materials** | | | | | | |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $2.11 | 35 | $73.85 |
| Lumber, planks, posts and timbers, untreated, rot resistant | 1612 | Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor. | Board Feet | $4.59 | 352 | $1,615.68 |
| Steel, Structural Braces and Supports | 2497 | Structural steel in various sizes and shapes. Includes materials and shipping only. | Pound | $1.37 | 2.5 | $3.43 |
| Earthfill Material, purchased, topsoil | 2745 | Purchased topsoil or screened loam. Material only. | Cubic Yards | $30.67 | 40 | $1,226.80 |

**Practice:** 821 - Low Tunnel Systems

**Scenario** #10 - Low tunnel < 1000 square feet- Year 1

**Scenario Description:**

Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Typical row ranges in size from 30 inches by 200 feet up to 400 feet in length. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 1 of implementation only.

**Before Situation:**

Crop production occurs within the zone growing season. Plant productivity and health is negatively impacted due to weather/environmental conditions delaying planting.

**After Situation:**

Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

**Feature Measure:** area covered by tunnel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $3,342.71

**Scenario Cost/Unit:** $6.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 46 | $2,461.46 |
| **Materials** | | | | | | |
| Clear polyethylene plastic, 6.0 mil | 2725 | 6.0 mil, UV-stabilized greenhouse clear plastic with anti-condensation coating. | Square Feet | $0.15 | 600 | $90.00 |
| Netting, Crop Protection, Fine mesh | 2761 | Synthetic netting fine mesh to exclude small insects. Includes materials and shipping only. | Square Feet | $0.14 | 600 | $84.00 |
| Row Cover Hoops | 2810 | Galvanized wire hoops to create low tunnels, 9 or 10 gauge wire. Materials and shipping only. | Each | $1.52 | 44 | $66.88 |
| Frost Blanket | 2811 | Heavy weight blanket, minimum 2 ounces per square yard, for frost protection. Materials and shipping only. | Square Feet | $0.16 | 600 | $96.00 |

**Practice:** 821 - Low Tunnel Systems

**Scenario** #11 - Low tunnel 1000-5000 square feet, Year 1

**Scenario Description:**

Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Typical row ranges in size from 30 inches by 500 feet up to 2000 feet in length. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 1 of implementation only.

**Before Situation:**

Crop production occurs within the zone growing season. Plant productivity and health is negatively impacted due to weather/environmental conditions delaying planting.

**After Situation:**

Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

**Feature Measure:** area covered by tunnel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 3,000.00

**Scenario Total Cost:** $5,244.35

**Scenario Cost/Unit:** $1.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 30 | $966.60 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 46 | $2,461.46 |
| **Materials** | | | | | | |
| Clear polyethylene plastic, 6.0 mil | 2725 | 6.0 mil, UV-stabilized greenhouse clear plastic with anti-condensation coating. | Square Feet | $0.15 | 3000 | $450.00 |
| Netting, Crop Protection, Fine mesh | 2761 | Synthetic netting fine mesh to exclude small insects. Includes materials and shipping only. | Square Feet | $0.14 | 3000 | $420.00 |
| Row Cover Hoops | 2810 | Galvanized wire hoops to create low tunnels, 9 or 10 gauge wire. Materials and shipping only. | Each | $1.52 | 203 | $308.56 |
| Frost Blanket | 2811 | Heavy weight blanket, minimum 2 ounces per square yard, for frost protection. Materials and shipping only. | Square Feet | $0.16 | 3000 | $480.00 |

**Practice:** 821 - Low Tunnel Systems

**Scenario** #12 - Low tunnel management- Year 2-3

**Scenario Description:**

Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 2-3 of implementation.

**Before Situation:**

Crop production occurs within the zone growing season. Low tunnel system Year 1 was implemented. Producer is building skill to manage the tunnel coverings as needed during the growing season to improve plant productivity and health.

**After Situation:**

Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

**Feature Measure:** area of tunnel

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $581.44

**Scenario Cost/Unit:** $0.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 2 | $216.66 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |

**Practice:** B000BFF1 - Buffer Bundle#1

**Scenario** #1 - Buffer Bundle#1

**Scenario Description:**
Addresses water quality degradation, degraded plant condition, fish/wildlife inadequate habitat, and/or air quality impacts.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 3.00

**Scenario Total Cost:** $7,779.67

**Scenario Cost/Unit:** $2,593.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 7 | $42.35 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 6 | $162.48 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 10 | $185.50 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 10 | $128.10 |
| Mechanical tree planter | 1600 | Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor. | Hours | $5.86 | 6 | $35.16 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1.23 | $437.97 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 1.08 | $330.75 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.69 | $173.96 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 6 | $204.12 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 5 | $83.40 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 5 | $77.85 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 5 | $11.20 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 341 | $446.71 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 2518 | $3,097.14 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 1 | $57.24 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 1 | $270.37 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** B000CPL10 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

**Scenario** #3 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

**Scenario Description:**
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $14,502.48

**Scenario Cost/Unit:** $145.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 30 | $741.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 19 | $972.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 41 | $5,423.48 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Switches and Controls, temp sensors | 1192 | Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $697.95 | 3 | $2,093.85 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,660.98 | 1 | $1,660.98 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** B000CPL11 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

**Scenario** #6 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

**Scenario Description:**
Addresses water quality degradation, insufficient water, and soil erosion.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $5,478.76

**Scenario Cost/Unit:** $54.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 41 | $2,097.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |

**Practice:** B000CPL12 - Non-Irrigated Precision Ag (MRBI)

**Scenario** #6 - Non-Irrigated Precision Ag (MRBI)

**Scenario Description:**
Addresses water quality degradation, soil quality, and soil erosion.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,340.78

**Scenario Cost/Unit:** $43.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, precision application | 949 | Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $9.31 | 100 | $931.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 100 | $892.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 9 | $1,190.52 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 35 | $542.50 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |

**Practice:** B000CPL13 - Non-Irrigated Cropland (MRBI)

**Scenario** #6 - Non-Irrigated Cropland (MRBI)

**Scenario Description:**
Addresses water quality degradation, soil quality, and soil erosion.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $3,717.96

**Scenario Cost/Unit:** $37.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 11 | $562.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 10 | $1,322.80 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |

**Practice:** B000CPL14 - YEAR 1 Irrigated Precision Ag Cropland (MRBI)

**Scenario** #6 - YEAR 1 Irrigated Precision Ag Cropland (MRBI)

**Scenario Description:**
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $14,838.18

**Scenario Cost/Unit:** $148.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 30 | $741.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 100 | $892.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 19 | $972.04 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 41 | $5,423.48 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 35 | $542.50 |
| Switches and Controls, temp sensors | 1192 | Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $697.95 | 3 | $2,093.85 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,660.98 | 1 | $1,660.98 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** B000CPL15 - YEAR 2+ Irrigated Precision Ag Cropland (MRBI)

**Scenario** #6 - YEAR 2+ Irrigated Precision Ag Cropland (MRBI)

**Scenario Description:**
Addresses water quality degradation, insufficient water, and soil erosion.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $5,814.46

**Scenario Cost/Unit:** $58.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 100 | $892.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 41 | $2,097.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 35 | $542.50 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |

**Practice:** B000CPL16 - Non-Irrigated Cropland with Water Bodies (MRBI)

**Scenario** #6 - Non-Irrigated Cropland with Water Bodies (MRBI)

**Scenario Description:**
Addresses water quality degradation, soil erosion, and soil quality

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,626.31

**Scenario Cost/Unit:** $46.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 2 | $12.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 11 | $562.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 9 | $1,190.52 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 2 | $101.72 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 2 | $253.82 |

**Practice:** B000CPL17 - Non-Irrigated Cropland with Water Bodies Riparian Forest Buffer (MRBI)

**Scenario** #6 - Non-Irrigated Cropland with Water Bodies Riparian Forest Buffer (MRBI)

**Scenario Description:**
Addresses water quality degradation, soil erosion, and soil quality

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $7,944.62

**Scenario Cost/Unit:** $79.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 18 | $444.60 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 2 | $61.24 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 2 | $12.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 4 | $108.32 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 16 | $204.96 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 11 | $562.76 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 18 | $579.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 9 | $1,190.52 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 872 | $1,072.56 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 100 | $460.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 100 | $233.00 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** B000CPL18 - Crop Bundle #18 - Precision Ag

**Scenario** #6 - Crop Bundle #18 - Precision Ag

**Scenario Description:**
Addresses water quality degradation, fish and wildlife inadequate habitat, air quality impairment, and either soil erosion or soil quality degradation resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,417.46

**Scenario Cost/Unit:** $44.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, precision application | 949 | Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $9.31 | 100 | $931.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 100 | $892.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.17 | $60.53 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.17 | $52.06 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.17 | $42.86 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 35 | $542.50 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |

**Practice:** B000CPL19 - Crop Bundle #19 - Soil Health Precision Ag

**Scenario** #6 - Crop Bundle #19 - Soil Health Precision Ag

**Scenario Description:**
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,457.83

**Scenario Cost/Unit:** $44.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, precision application | 949 | Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $9.31 | 100 | $931.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 100 | $892.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 13 | $1,719.64 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 35 | $542.50 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 1 | $270.37 |

**Practice:** B000CPL20 - Crop Bundle #20 - Soil Health Assessment

**Scenario** #6 - Crop Bundle #20 - Soil Health Assessment

**Scenario Description:**
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,332.07

**Scenario Cost/Unit:** $43.32

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 16 | $2,116.48 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 15 | $232.50 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 1 | $270.37 |

**Practice:** B000CPL21 - Crop Bundle #21 - Crop Bundle (Organic)

**Scenario** #6 - Crop Bundle #21 - Crop Bundle (Organic)

**Scenario Description:**
Addresses soil quality degradation, water quality degradation, and degraded plant condition resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $5,746.09

**Scenario Cost/Unit:** $57.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 10 | $247.00 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 2 | $12.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 10 | $185.50 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 10 | $128.10 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 9 | $1,190.52 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 341 | $446.71 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 340 | $418.20 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 1 | $57.24 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** B000CPL22 - Crop Bundle #22 - Erosion Bundle (Organic)

**Scenario** #6 - Crop Bundle #22 - Erosion Bundle (Organic)

**Scenario Description:**
Addresses soil quality degradation, water quality degradation, soil erosion, and fish and wildlife inadequate habitat resource concerns.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acres of cropland where enhancem

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,619.77

**Scenario Cost/Unit:** $46.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 13 | $665.08 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 14 | $1,851.92 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 1 | $270.37 |

**Practice:** B000CPL23 - Crop Bundle #23 - Pheasant and quail habitat

**Scenario** #2 - Crop Bundle #23 - Pheasant and quail habitat

**Scenario Description:**
Addresses wildlife inadequate habitat, water quality degradation and/or air quality impacts, and soil health and/or degraded plant condition.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

**After Situation:**
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** Acres where the bundle is impleme

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $2,551.21

**Scenario Cost/Unit:** $63.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 1 | $270.37 |

**Practice:** B000CPL24 - Crop Bundle #24 - Cropland Soil Health Management System

**Scenario** #6 - Crop Bundle #24- Cropland Soil Health Management System

**Scenario Description:**
Addresses soil health, water quality (or water quality and air quality), and either soil erosion, soil compaction, or plant pest pressure.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

**After Situation:**
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $3,316.86

**Scenario Cost/Unit:** $33.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 14 | $1,851.92 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 2 | $263.82 |

**Practice:** B000CPL25 - Climate Smart Advanced Soil Health

**Scenario** #6 - Crop Land Bundle# 25- Climate Smart Advanced Soil Health

**Scenario Description:**

Improve crop land soil health by minimizing soil disturbance, PAMS pest management, building soil organic matter, providing habitat and reducing nutrient and pesticide loss to water.

**Before Situation:**

Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

**After Situation:**

The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acres applied

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $14,118.90

**Scenario Cost/Unit:** $141.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 100 | $1,321.00 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 100 | $605.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 100 | $2,227.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 11 | $562.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 17 | $2,248.76 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 100 | $5,724.00 |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** B000FST1 - Forest Bundle#1

**Scenario** #1 - Forest Bundle#1

**Scenario Description:**
Addresses forest management on sites that are not adapted to natural fire disturbances. Addresses resouce concerns air quality impacts, degraded plant condition and fish/wildlife inadequate habitat.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 111.00

**Scenario Total Cost:** $10,739.42

**Scenario Cost/Unit:** $96.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 45 | $299.25 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 15 | $370.50 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 41 | $2,698.21 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 11 | $140.91 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 7 | $358.12 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 49 | $1,578.78 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |
| CAP Labor, forester | 1302 | Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage. | Hours | $84.00 | 17 | $1,428.00 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 20 | $208.60 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $23.10 | 21 | $485.10 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 605 | $792.55 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 218 | $268.14 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** B000FST2 - Forest Bundle #2 - Post-fire Management

**Scenario** #7 - Forest Bundle #2 - Post-fire Management

**Scenario Description:**

Forest stand improvement that improves forest health to reduce the risk of wildfire and wildlife habitat. Addresses air quality impacts, degraded plant condition, and fish/wildlife inadequate habitat.

**Before Situation:**

Resources are protected at the minimum level of conservation practice standard(s) applied as part of the enhancement.

**After Situation:**

The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $10,599.48

**Scenario Cost/Unit:** $1,059.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8 | $53.20 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 28 | $3,001.88 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 30 | $1,974.30 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 28 | $952.56 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 19 | $2,513.32 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 30 | $1,525.80 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** B000FST3 - Forest Bundle #3

**Scenario** #6 - B000FST3 - Forest Bundle #3

**Scenario Description:**

Forest stand improvement that improves forest health due to poor logging practices. Addresses soil organic matter depletion, degraded plant condition, and inadequate fish/wildlife habitat.

**Before Situation:**

Resources are protected at the minimum level of conservation practice standard(s) applied as part of the enhancement.

**After Situation:**

The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $11,281.69

**Scenario Cost/Unit:** $564.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 27 | $179.55 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 43 | $2,829.83 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 20 | $371.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 59 | $3,018.44 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1.5 | $80.27 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 21 | $2,777.88 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 10 | $155.00 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 15 | $156.45 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $23.10 | 1 | $23.10 |
| Herbicide, Triazine | 1321 | Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $91.09 | 10 | $910.90 |
| Certified Organic, Perennial Grasses, Legumes and/or Forbs | 2340 | Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only. | Acres | $83.14 | 3 | $249.42 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** B000FST4 - Forest Bundle #4

**Scenario** #6 - B000FST4 - Forest Bundle #4

**Scenario Description:**
Forest management to improve sugar maple stands. Addresses soil organic matter depletion, degraded plant condition, and inadequate fish/wildlife habitat.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $24,769.34

**Scenario Cost/Unit:** $1,238.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 33 | $219.45 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 10 | $247.00 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 16 | $1,715.36 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 50 | $3,290.50 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 36 | $461.16 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 33 | $1,688.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 44 | $1,417.68 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 40 | $5,291.20 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 10 | $155.00 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 15 | $156.45 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1.5 | $25.02 |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 20 | $1,017.20 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $23.10 | 10 | $231.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1.5 | $23.36 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1.5 | $3.36 |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 340 | $2,318.80 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 360 | $1,684.80 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 360 | $2,030.40 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.07 | 360 | $25.20 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 360 | $878.40 |
| Certified Organic, Perennial Grasses, Legumes and/or Forbs | 2340 | Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only. | Acres | $83.14 | 3 | $249.42 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** B000GRZ1 - Grazing Bundle 1 - Range and Pasture

**Scenario** #6 - Grazing Bundle 1 - Range and Pasture

**Scenario Description:**
This bundle addresses soil erosion, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528L, E315A, and E645A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $4,009.56

**Scenario Cost/Unit:** $100.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 24 | $592.80 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 24 | $328.08 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 10 | $200.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 58 | $1,868.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 1 | $62.53 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** B000GRZ2 - Grazing Bundle 2 - Range and Pasture

**Scenario** #6 - Grazing Bundle 2 - Range and Pasture

**Scenario Description:**

This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E382A, and E580A.

**Before Situation:**

Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $9,062.30

**Scenario Cost/Unit:** $2,265.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 5 | $48.05 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 13 | $321.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 5 | $135.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 9 | $166.95 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 8 | $102.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 81 | $2,609.82 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $135.85 | 4 | $543.40 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $11.38 | 20 | $227.60 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 8 | $206.16 |
| Post, Steel T, 1.33 lbs, 6 ft. | 15 | Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only. | Each | $7.85 | 90 | $706.50 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.21 | 1320 | $277.20 |
| Vinyl Undersill Strips | 241 | Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only. | Feet | $0.08 | 2000 | $160.00 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 65 | $443.30 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 65 | $304.20 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 65 | $416.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.26 | 65 | $81.90 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $2.49 | 65 | $161.85 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 65 | $299.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 195 | $454.35 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** B000GRZ3 - Grazing Bundle 3 - Range and Pasture

**Scenario** #6 - Grazing Bundle 3 - Range and Pasture

**Scenario Description:**
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E390B, and E580A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 6.00

**Scenario Total Cost:** $10,325.12

**Scenario Cost/Unit:** $1,720.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 5 | $48.05 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 13 | $321.10 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 4 | $24.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 5 | $135.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 8 | $102.48 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 81 | $2,609.82 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $135.85 | 4 | $543.40 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $11.38 | 20 | $227.60 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 8 | $206.16 |
| Post, Steel T, 1.33 lbs, 6 ft. | 15 | Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only. | Each | $7.85 | 90 | $706.50 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.21 | 1320 | $277.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 4 | $203.44 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 65 | $443.30 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 65 | $304.20 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 65 | $416.00 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.26 | 65 | $81.90 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $2.49 | 65 | $161.85 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 65 | $299.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 195 | $454.35 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 2 | $540.74 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** B000GRZ4 - Grazing Bundle 4 - Range and Pasture

**Scenario** #6 - Grazing Bundle 4 - Range and Pasture

**Scenario Description:**

This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E391C, and E580A.

**Before Situation:**

Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $12,889.09

**Scenario Cost/Unit:** $3,222.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 5 | $48.05 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 29 | $716.30 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 2 | $61.24 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 2 | $12.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 9 | $243.72 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 24 | $307.44 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 99 | $3,189.78 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 9 | $306.18 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 12 | $642.12 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $135.85 | 4 | $543.40 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $11.38 | 20 | $227.60 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 8 | $206.16 |
| Post, Steel T, 1.33 lbs, 6 ft. | 15 | Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only. | Each | $7.85 | 90 | $706.50 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.21 | 1320 | $277.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 872 | $1,072.56 |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 65 | $443.30 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 65 | $416.00 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.26 | 65 | $81.90 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $2.49 | 65 | $161.85 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 165 | $759.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 295 | $687.35 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** B000GRZ5 - Grazing Bundle 5 - Range and Pasture

**Scenario** #6 - Grazing Bundle 5 - Range and Pasture

**Scenario Description:**
This bundle addresses livestock production limitation, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528A, E315A, and E645A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,050.00

**Scenario Total Cost:** $6,985.02

**Scenario Cost/Unit:** $6.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 28 | $691.60 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 24 | $328.08 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 36 | $720.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 65 | $2,094.30 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 1 | $62.53 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** B000PST5 - Pasture Bundle 5

**Scenario** #6 - Pasture Bundle #5

**Scenario Description:**
Implementation of site specific strategies applied to range or pasture land uses through adoption of the following CSP enhancements: E528J, E315A, and E645A.

**Before Situation:**
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

**After Situation:**
Adoption of these bundled enhancements provides a combined benefit for resource protection that exceeds the minimum level for the associated practice standards in order to address the resource concerns Soil Erosion or Water Quality Degradation, Degraded Plant Condition, and Fish and Wildlife Inadequate Habitat.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 60.00

**Scenario Total Cost:** $4,315.43

**Scenario Cost/Unit:** $71.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 24 | $592.80 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 6 | $111.30 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 24 | $328.08 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 6 | $120.12 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 56 | $1,804.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 4 | $250.12 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |

**Practice:** B000PSTX - Pasture Bundle #6 - Pasture

**Scenario** #14 - Pasture Bundle #6

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired pasture composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity following the recommendations of a qualifying professional, as detailed in the documentation and implementation requirements. Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pastures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing. Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting. Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 315-Herbaceous Weed Treatment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing. The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting. The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 315-Herbaceous Weed Treatment.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $9,550.80

**Scenario Cost/Unit:** $95.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 25 | $617.50 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 4 | $54.68 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 36 | $720.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 5 | $161.10 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 4 | $250.12 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |
| Nutritional Balance Analyzer, fecal sample analysis only | 1127 | NIRS fecal analysis, animal performance report. Includes materials and shipping only. | Each | $47.39 | 6 | $284.34 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 100 | $4,545.00 |

**Practice:** E199A - Comprehensive Conservation Plan

**Scenario** #6 - Single Enterprise-Low

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves one agricultural enterprise and a.) 1 Land use with less than or equal to 4 priority resource concerns, OR b.) 2-3 Land Uses with less than or equal to two priority resource concern categories per land use.

**Before Situation:**

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

**After Situation:**

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $6,973.42

**Scenario Cost/Unit:** $6,973.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 10 | $1,081.50 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 8 | $829.12 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 60 | $5,062.80 |

**Practice:** E199A - Comprehensive Conservation Plan

**Scenario** #22 - Single Enterprise-Medium

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves one agricultural enterprise and a.) 1 Land Use with greater than 4 priority resource concerns, OR b.) 2-3 Land Use with 3 to 4 priority resource concern categories per land use, OR c.) 4 or more Land Use with less than or equal to 2 priority resource concerns.

**Before Situation:**

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

**After Situation:**

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,075.58

**Scenario Cost/Unit:** $9,075.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 10 | $1,081.50 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 12 | $1,243.68 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 80 | $6,750.40 |

**Practice:** E199A - Comprehensive Conservation Plan

**Scenario** #38 - Single Enterprise-High

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves one agricultural enterprise and a.) 2-3 Land Use with 4 or more priority resource concern categories per land use, OR b.) 4 or more Land Use with 3 to 4 priority resource concerns.

**Before Situation:**

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

**After Situation:**

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guidesheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,238.58

**Scenario Cost/Unit:** $11,238.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 30 | $3,244.50 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 12 | $1,243.68 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 80 | $6,750.40 |

**Practice:** E199A - Comprehensive Conservation Plan

**Scenario** #54 - Multiple Enterprise-Medium

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves two or more agricultural enterprises and a.) 1 Land Use with up to 4 priority resource concerns, OR b.) 2-3 Land Use with 1 to 2 priority resource concern categories per land use.

**Before Situation:**

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

**After Situation:**

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $12,496.94

**Scenario Cost/Unit:** $12,496.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 30 | $3,244.50 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 90 | $7,594.20 |

**Practice:** E199A - Comprehensive Conservation Plan

**Scenario** #70 - Multiple Enterprise-High

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. This typical scenario involves two or more agricultural enterprises and a.) 2-3 Land Use with 3 to 4 priority resource concern categories per land use, OR b.) 2-3 Land Use with 4 or more priority resource concerns, OR c.) 4 or more Land Use with any amount of priority resource concerns

**Before Situation:**

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

**After Situation:**

TSP conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $14,422.24

**Scenario Cost/Unit:** $14,422.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, agronomist | 1295 | Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner. | Hours | $108.15 | 40 | $4,326.00 |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 16 | $1,658.24 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 100 | $8,438.00 |

**Practice:** E199A - Comprehensive Conservation Plan

**Scenario** #86 - Comprehensive Conservation Plan for Operation with > 2 land uses and 2 or more resource concerns

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for the identified land uses by each land management system included in each of the producer's operations. Does not include livestock waste storage planning or evaluation of existing components.

**Before Situation:**

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for all land uses and each land management system for each enterprise or farm operation.

**After Situation:**

Planner conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements of E199A Guidesheet.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,782.42

**Scenario Cost/Unit:** $3,782.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 8 | $829.12 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 35 | $2,953.30 |

**Practice:** E199A - Comprehensive Conservation Plan

**Scenario** #102 - Comprehensive Conservation Plan on 2 or more Land Use

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for the identified land uses by each land management system included in the producer's operation. Does not include livestock waste storage planning or evaluation of existing components.

**Before Situation:**

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for 2 land uses and each land management system for each enterprise or farm operation.

**After Situation:**

Planner conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements of E199A Guidesheet.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3,360.52

**Scenario Cost/Unit:** $3,360.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 8 | $829.12 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 30 | $2,531.40 |

**Practice:** E199A - Comprehensive Conservation Plan

**Scenario** #118 - Basic Comprehensive Conservation Plan-One Land Use

**Scenario Description:**

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer's operation. Does not include livestock waste storage planning or evaluation of existing components.

**Before Situation:**

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

**After Situation:**

Planner conducts an on-site inventory of all land uses and land management systems in the producer's operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guidesheet.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $2,516.72

**Scenario Cost/Unit:** $2,516.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| CAP Labor, professional engineer | 1297 | Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price). | Hours | $103.64 | 8 | $829.12 |
| Cap Labor, conservation scientist | 1300 | Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering. | Hours | $84.38 | 20 | $1,687.60 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario** #6 - CSP EAP Cropland and Farmstead

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land uses cropland and farmstead.

**Before Situation:**

Producer implements conservation activities on cropland or farmstead to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7.50

**Scenario Cost/Unit:** $7.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Cropland/Farmstead | 2737 | Existing Activity Payment for Cropland or Farmstead land use. | Acres | $7.50 | 1 | $7.50 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario** #19 - CSP EAP Pasture

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use pasture.

**Before Situation:**

Producer implements conservation activities on pasture to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $3.00

**Scenario Cost/Unit:** $3.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Pasture | 2738 | Existing Activity Payment for Pasture land use. | Acres | $3.00 | 1 | $3.00 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario** #29 - CSP EAP Range

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use range.

**Before Situation:**

Producer implements conservation activities on range to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1.00

**Scenario Cost/Unit:** $1.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Range | 2739 | Existing Activity Payment for Range land use. | Acres | $1.00 | 1 | $1.00 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario** #45 - CSP EAP NIPF

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land uses non-industrial private forest land (NIPF).

**Before Situation:**

Producer implements conservation activities on NIPF to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $0.50

**Scenario Cost/Unit:** $0.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Non-Industrial Private Forestland (NIPF) | 2740 | Existing Activity Payment for Non-Industrial Private Forestland (NIPF). | Acres | $0.50 | 1 | $0.50 |

**Practice:** E300EAP1 - Existing Activity Payment-Land Use

**Scenario** #61 - CSP EAP AAL

**Scenario Description:**

This existing activity payment component (EAP1) provides a CSP participant with a payment for existing stewardship specific to the land uses included in the operation. This scenario covers the land use associated agricultural land (AAL).

**Before Situation:**

Producer implements conservation activities on AAL to achieve a base level of stewardship.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the base level of stewardship assessed at the time of enrollment.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $0.50

**Scenario Cost/Unit:** $0.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Associated Agricultural Land (AAL) | 2741 | Existing Activity Payment for Associated Agricultural Land (AAL) | Acres | $0.50 | 1 | $0.50 |

**Practice:** E300EAP2 - Existing Activity Payment-Resource Concern

**Scenario** #6 - CSP EAP RC met at time of enrollment

**Scenario Description:**

This existing activity payment component (EAP2) provides a CSP participant with a payment for existing stewardship specific to the number of resource concerns met at the time of enrollment.

**Before Situation:**

Producer implements conservation activities across all land uses included in the operation to meet a minimum of two resource concerns at the time of enrollment.

**After Situation:**

Through participation in the CSP, the producer continues to maintain or improve the resource concerns met at the time of enrollment.

**Feature Measure:** Resource Concern Met

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $300.00

**Scenario Cost/Unit:** $300.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| EAP - Resource Concern | 2742 | Existing Activity Payment for Resource Concern(s). | Number | $300.00 | 1 | $300.00 |

**Practice:** E300GCI - Grassland Conservation Initiative

**Scenario** #6 - Grassland Conservation Initiative Activity

**Scenario Description:**

The Grassland Conservation Initiative Activity assists producers in protecting grazing uses; conserving and improving soil, water, and wildlife resources; and achieving related conservation values by conserving eligible land through grassland conservation contracts. Producers participating in the GCI must agree to meet or exceed planning criteria for at least one of the priority resource concerns: Soil Erosion, Soil Quality Degradation, Water Quality Degradation, Fish and Wildlife Habitat Improvement, Air Quality Impacts, Degraded Plant Condition, and/or Livestock Production Limitation.

**Before Situation:**

Eligible base acres have been maintained and reported as grass, idle, or fallow for all years between January 2009 and December 2017.

**After Situation:**

Through participation in the GCI, the producer will meet or exceed the planning criteria for at least one priority resource concern by managing the enrolled land to maintain grassland values even if the producer chooses to plant a crop on the enrolled acres.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $18.00

**Scenario Cost/Unit:** $18.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Grassland Conservation Initiative - Labor | 2736 | Labor to assist producers protect grazing uses through grassland conservation contracts. | Acres | $18.00 | 1 | $18.00 |

**Practice:** E314A - Brush management to improve wildlife habitat

**Scenario** #1 - Brush management to improve wildlife habitat

**Scenario Description:**

Brush management is employed to create a desired plant community, consistent with the related ecological site steady state, which will maintain or enhance the wildlife habitat desired for the identified wildlife species. It will be designed to provide plant structure, density and diversity needed to meet those habitat objectives. This enhancement does not apply to removal of woody vegetation by prescribed fire or removal of woody vegetation to facilitate a land use change.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 314 - Brush Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 314 - Brush Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $2,413.77

**Scenario Cost/Unit:** $24.14

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 12 | $240.24 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 32 | $1,637.12 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |

**Practice:** E315A - Herbaceous weed treatment to create plant communities consistent with the ecological site

**Scenario** #1 - Herbaceous weed treatment to create plant communities consistent with the ecological site

**Scenario Description:**

Mechanical, chemical, or biological, herbaceous weed treatment will be employed to control targeted, herbaceous weeds so as to create, release, or restore desired plant communities that are consistent with achievable, ecological site, steady state descriptions.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $131.62

**Scenario Cost/Unit:** $13.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |

**Practice:** E327A - Conservation cover for pollinators and beneficial insects

**Scenario** #7 - Conservation cover for pollinators and beneficial insects

**Scenario Description:**

Seed or plug nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, grassed waterways, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 Conservation Cover.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 Conservation Cover.

**Feature Measure:** acre planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $25,636.34

**Scenario Cost/Unit:** $512.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 11 | $271.70 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 8 | $244.96 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 50 | $1,006.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 50 | $22,143.50 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** E327B - Establish Monarch butterfly habitat

**Scenario** #1 - Establish Monarch butterfly habitat

**Scenario Description:**
Seed or plug milkweed (Asclepias spp.), and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips, and similar areas.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 - Conservation Cover

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 - Conservation Cover

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $853.50

**Scenario Cost/Unit:** $853.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 1 | $30.62 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |

**Practice:** E328A - Resource conserving crop rotation

**Scenario** #1 - Resource conserving crop rotation

**Scenario Description:**

Establish a Resource Conserving Crop Rotation. Rotation must include AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,851.92

**Scenario Cost/Unit:** $18.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 14 | $1,851.92 |

**Practice:** E328B - Improved resource conserving crop rotation

**Scenario** #1 - Improved resource conserving crop rotation

**Scenario Description:**

Improve an existing Resource Conserving Crop Rotation. Must enrich an existing rotation which already includes AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $661.40

**Scenario Cost/Unit:** $6.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E328C - Conservation crop rotation on recently converted CRP grass/legume cover

**Scenario** #1 - Conservation crop rotation on recently converted CRP grass/legume cover for water erosion

**Scenario Description:**

Implement a crop rotation management system on crop land acres that have recently converted from CRP grass/legume conservation cover to annual planted crops. Crop rotation minimizes disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than 10 and reduces soil erosion from water or wind to below soil tolerance (T) level. The current NRCS wind and water erosion prediction technologies must be used to document the rotation, soil erosion estimate, and STIR calculations. *This enhancement is limited to acres where the conversion event took place not more than 2 years prior. Enhancement not applicable on hayland.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $396.84

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E328D - Leave standing grain crops unharvested to benefit wildlife

**Scenario** #1 - Leave standing grain crops unharvested to benefit wildlife

**Scenario Description:**
Implement a crop rotation which allows a portion of grain crops to be left in fields un-harvested to provide food and cover for wildlife during winter months.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $208.96

**Scenario Cost/Unit:** $5.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.17 | $60.53 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.17 | $52.06 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.17 | $42.86 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** E328E - Soil health crop rotation

**Scenario** #1 - Soil health crop rotation

**Scenario Description:**

Implement a crop rotation which addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. The rotation will include at least 4 different crop and/or cover crop types (crop types include cool season grass, warm season grass, cool season broadleaf, warm season broadleaf) grown in a sequence that will produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $661.40

**Scenario Cost/Unit:** $6.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E328F - Modifications to improve soil health and increase soil organic matter

**Scenario** #1 - Modifications to improve soil health and increase soil organic matter

**Scenario Description:**

Use of soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops). During Year 3 a follow up assessment will be completed to allow time for the modifications to show increased soil organic matter. Modified system must produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $264.19

**Scenario Cost/Unit:** $2.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |

**Practice:** E328G - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

**Scenario** #1 - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

**Scenario Description:**

Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Diverse rotation with living roots and residue cover throughout year and minimal disturbance. Enhancement not applicable on hayland.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $661.40

**Scenario Cost/Unit:** $6.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E328H - Conservation crop rotation to reduce the concentration of salts

**Scenario** #1 - Conservation crop rotation to reduce the concentration of salts

**Scenario Description:**

Implement a crop rotation to reduce the concentration of salts and other chemicals from saline seeps. The rotation should include at least 3 crops and/or cover crops grown in a sequence in the recharge areas of saline seeps that have rooting depths and water requirements adequate to fully utilize all available soil water. Do not use summer fallow. Use an approved water balance procedure to determine crop selection and sequence. Select crops with a tolerance to salinity levels that match the salinity of the discharge area. (See state lists )

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $529.12

**Scenario Cost/Unit:** $5.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E328I - Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

**Scenario** #1 - Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

**Scenario Description:**

Establish a forage crop (single species or mix) following a primary annual crop to take up excess soil nutrients. Select forage known to effectively utilize and scavenge nutrients. Forage shall be harvested for forage, but not be grazed or burned.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acres of Cropland with New Crop R

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $606.62

**Scenario Cost/Unit:** $6.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 5 | $77.50 |

**Practice:** E328J - Improved crop rotation to provide benefits to pollinators

**Scenario** #1 - Improved crop rotation to provide benefits to pollinators

**Scenario Description:**

Improve the existing crop rotation by adding pollinator friendly crops into the rotation. The crop rotation shall include a minimum of three different crops in a minimum five year crop rotation. Each year, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Use of insecticides is limited for the pollinator friendly crop.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

**Feature Measure:** Acres planted to pollinator rotation

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $529.12

**Scenario Cost/Unit:** $105.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E328K - Multiple crop types to benefit wildlife

**Scenario** #6 - Multiple crop types to benefit wildlife

**Scenario Description:**

Alternating crops in a systematic arrangement of strips across a field to provide diverse rotations of crops that provide wildlife food. At least two crops will be planted in adjacent strips a minimum of 0.5 acres in size.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 328 - Conservation Crop Rotation.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 328 - Conservation Crop Rotation.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $132.28

**Scenario Cost/Unit:** $6.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |

**Practice:** E328L - Leaving tall crop residue for wildlife

**Scenario** #6 - Leaving tall crop residue for wildlife

**Scenario Description:**

Fields may be harvested but must leave crop residue standing a minimum of 14 inches. Residue will be left through winter and into spring, providing valuable winter cover and forage for wildlife spanning late summer and through the following winter.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

**Feature Measure:** acres with small grain stubble/resi

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $529.12

**Scenario Cost/Unit:** $13.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E328M - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

**Scenario** #22 - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

**Scenario Description:**

Diversify the existing crop rotation by adding canola or sunflower into the rotation. Canola or sunflower must be planted on a minimum of 5% of cropland acres. Pesticide use is limited to pre-bloom or bloom and in accordance with IPM and industry best management practices.

**Before Situation:**

Resources are protected at the minimum level for the Conservation Practice Standard (CPS) 328- Conservation Crop Rotation.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328-Conservation Crop Rotation

**Feature Measure:** Acres planned

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $529.12

**Scenario Cost/Unit:** $13.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E328N - Intercropping to Improve Soil Health

**Scenario** #6 - Intercropping to improve soil health

**Scenario Description:**

This enhancement involves the use of intercropping principles (i.e., growing two or more crops in close proximity to each other during part or all of their life cycles) to promote interactions that improve soil health, plant health, reduce inputs via increased biodiversity and contribute to pest management. Incorporating intercropping principles into an agricultural operation increases diversity and interaction between plants, arthropods, mammals, birds and microorganisms resulting in a more stable crop-ecosystem and a more efficient use of space, water, sunlight and nutrients. Furthermore, soil health is benefited by increasing ground coverage with living vegetation which reduces erosion and by increasing the quantity and diversity of root exudates which enhances soil fauna. This collaborative type of crop management mimics nature and is subject to fewer pest outbreaks, improved nutrient cycling and crop nutrient uptake, and increased water infiltration and moisture retention. This enhancement cannot be used for annual hay or silage crops. It is for grain/seed production only.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

**Feature Measure:** acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $661.40

**Scenario Cost/Unit:** $6.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E328O - Perennial Grain Conservation Crop Rotation

**Scenario** #6 - Perennial Grain Rotation

**Scenario Description:**

This practice payment is provided to the producer for the time needed to plan and implement the logistics of changing the rotation to effectively implement a conservation crop rotation on a cropland farm by adding a perennial grain as the third crop to their cropping system. The crop is intended to be a harvested and must be grown for at least 2 years after planting. No foregone income. Cost represents typical situations for conventional and organic producers. In this region this practice may be part of a conservation management system on both organic and non-organic operations that: (1) Reduces erosion; (2) Improves soil fertility and tilth; (3) Interrupts pest cycles; and (4) Builds soil organic matter. In applicable areas, reduces depletion of soil moisture or otherwise reduces the need for irrigation.

**Before Situation:**

Resources are protected at the minimum level for the Conservation Practice Standard (CPS) 328- Conservation Crop Rotation.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328-Conservation Crop Rotation.

**Feature Measure:** Area Planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $7,290.59

**Scenario Cost/Unit:** $182.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 3 | $324.99 |
| **Equipment Installation** | | | | | | |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 40 | $890.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 40 | $1,288.80 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |

**Practice:** E328P - Low Nitrogen Requirement Annual Crop Rotation

**Scenario** #6 - Low Nitrogen Requirement Annual Crop Rotation

**Scenario Description:**
Design an annual crop rotation which less than the average annual nitrogen fertilizer requirement compared to the current (benchmark) crop rotation.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $3,343.68

**Scenario Cost/Unit:** $33.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 5 | $267.55 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 20 | $2,645.60 |

**Practice:** E329A - No till to reduce soil erosion

**Scenario** #1 - No till to reduce soil erosion

**Scenario Description:**

Establish no till system to reduce sheet and rill erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $396.84

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E329B - No till to reduce tillage induced particulate matter

**Scenario** #1 - No till to reduce tillage induced particulate matter

**Scenario Description:**

Establish no till system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $396.84

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E329C - No till to increase plant-available moisture

**Scenario** #1 - No till to increase plant-available moisture

**Scenario Description:**

Establish a no till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $396.84

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E329D - No till system to increase soil health and soil organic matter content

**Scenario** #1 - No till system to increase soil health and soil organic matter content

**Scenario Description:**

Establish a no till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $529.12

**Scenario Cost/Unit:** $5.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E329E - No till to reduce energy

**Scenario** #1 - No till to reduce energy

**Scenario Description:**

Establish a no till system which reduces total energy consumption associated with field operations by at least 25% compared to current tillage system (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $529.12

**Scenario Cost/Unit:** $5.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E334A - Controlled traffic farming to reduce compaction

**Scenario** #1 - Controlled traffic farming to reduce compaction

**Scenario Description:**

Establish a controlled traffic system where no more than 25% of the surface is tracked with heavy axel loads to minimize soil compaction. For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks. If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 334 - Controlled Traffic Farming

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 334 - Controlled Traffic Farming

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $983.60

**Scenario Cost/Unit:** $9.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E338A - Strategically planned, patch burning for grazing distribution and wildlife habitat

**Scenario** #1 - Strategically planned, patch burning for grazing distribution and wildlife habitat

**Scenario Description:**

Patch burn grazing is the application of prescribed fires on portions of an identified grazing unit at different times of the year. Patch burn grazing allows grazing animals to select where they want to graze creating a mosaic of vegetation structures and diversity that will maintain or enhance the wildlife habitat desired for the identified wildlife species and maintain livestock production.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 338 - Prescribed Burning

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 338 - Prescribed Burning

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $829.28

**Scenario Cost/Unit:** $8.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hours | $100.94 | 4 | $403.76 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 4 | $199.24 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** E338B - Short-interval burns to promote a healthy herbaceous plant community

**Scenario** #1 - Short-interval burns to promote a healthy herbaceous plant community

**Scenario Description:**

The controlled use of fire is applied in a forest to restore fire-adapted plants while improving wildlife habitat, wildlife food supply, and reducing the risk of damage from intense, severe wildfires. The ideal interval between prescribed burns is not often achieved. To improve the effectiveness of prescribed burning, the frequency of prescribed burning is increased appropriately, for a specified time period, to help restore ecological conditions in forests and woodlands. Short return interval prescribed burning is used to regenerate desirable tree species, improve the condition of fire-adapted plants and native herbaceous vegetation, improve wildlife food supply, create wildlife habitat (snags and den/cavity trees), limit encroachment of competing vegetation including non-native species, and reduce the future risk of damage from intense, severe wildfires.

**Before Situation:**

The site has a mixture of woody sprouts and some herbaceous vegetation in the forest understory.

**After Situation:**

The site has a mixture of warm season perennial vegetation and cool-season annual forages. Grazing is occurring to manage the herbaceous vegetation and keep undesirable woody vegetation from occupying the forest understory.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $4,496.67

**Scenario Cost/Unit:** $112.42

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 8 | $587.92 |
| Truck, water | 1448 | Water tanker truck. Equipment only. Labor not included. | Hours | $191.04 | 8 | $1,528.32 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 8 | $398.48 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E338C - Sequential patch burning

**Scenario** #1 - Sequential patch burning

**Scenario Description:**

Conduct prescribed under burning beneath a forest canopy (ground fire), burning a portion of the area each year to create a mosaic of vegetation in several stages of development, to provide a more diverse understory and contribute to wildlife habitat. The health of conifer and oak-conifer forests, particularly longleaf pine with a characteristic herbaceous understory, is dependent on fire or another means of controlling encroaching woody vegetation. A healthy longleaf or shortleaf pine, or pine-oak forest, can support a wide array of wildlife including pollinators and several endangered or threatened species.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 338 - Prescribed Burning

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 338 - Prescribed Burning

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $2,027.25

**Scenario Cost/Unit:** $202.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 2 | $37.10 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 2 | $25.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $5.19 | 5 | $25.95 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** E340A - Cover crop to reduce soil erosion

**Scenario** #1 - Cover crop to reduce soil erosion

**Scenario Description:**

Cover crop added to current crop rotation to reduce soil erosion from water and wind to below soil tolerance (T) level. Cover crops grown during critical erosion period(s). Species are selected that will have physical characteristics to provide adequate erosion protection.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $784.76

**Scenario Cost/Unit:** $7.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| **Materials** | | | | | | |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 20 | $733.60 |

**Practice:** E340B - Intensive cover cropping to increase soil health and soil organic matter content

**Scenario** #1 - Intensive cover cropping to increase soil health and soil organic matter content

**Scenario Description:**

Implementation of cover crop mix to provide soil coverage during ALL non-crop production periods in an annual crop rotation. Cover crop shall not be harvested or burned. Planned crop rotation including cover crops and associated management activities must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document SCI calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,409.36

**Scenario Cost/Unit:** $14.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** E340C - Use of multi-species cover crops to improve soil health and increase soil organic matter

**Scenario** #1 - Use of multi-species cover crops to improve soil health and increase soil organic matter

**Scenario Description:**

Implement a multi-species cover crop to add diversity and increase biomass production to improve soil health and increase soil organic matter. Cover crop mix must include a minimum of 4 different species. The cover crop mix will increase diversity of the crop rotation by including crop types currently missing, e.g. Cool Season Grass (CSG), Cool Season Broadleaves (CSB), Warm Season Grasses (WSG), Warm Season Broadleaves (WSB).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,247.12

**Scenario Cost/Unit:** $12.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** E340D - Intensive orchard/vineyard floor cover cropping to increase soil health

**Scenario** #1 - Intensive orchard/vineyard floor cover cropping to increase soil health

**Scenario Description:**

Implement orchard or vineyard floor cover crops. Cover crop shall not be harvested, grazed, or burned. Must achieve a soil conditioning index of zero or higher and produce a positive trend in the Organic Matter subfactor over the life of the rotation.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,247.12

**Scenario Cost/Unit:** $12.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** E340E - Use of soil health assessment to assist with development of cover crop mix to improve soil health

**Scenario** #1 - Use of soil health assessment to assist with development of cover crop mix to improve soil health

**Scenario Description:**

Soil health assessment (year 1) to evaluate current crop rotation in addressing soil organic matter depletion. Results are utilized to select a multi-species cover crop mix to add to the current crop rotation. Follow up assessment completed (year 3).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $372.59

**Scenario Cost/Unit:** $3.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 1 | $57.24 |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |

**Practice:** E340F - Cover crop to minimize soil compaction

**Scenario** #1 - Cover crop to minimize soil compaction

**Scenario Description:**

Establish a cover crop mix that includes plants with both fibrous root and deep rooted systems. Fibrous to treat and prevent both near surface (0-4”) and deep (>4”) soil compaction and deep rooted to break up deep compacted soils. Cover crop shall not be harvested, grazed, or burned.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,195.96

**Scenario Cost/Unit:** $11.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** E340G - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

**Scenario** #1 - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

**Scenario Description:**

Establish a cover crop mix to take up excess soil nutrients. Select cover crop species for their ability to effectively utilize nutrients. Terminate the cover crop as late as practical to maximize plant biomass production and nutrient uptake. Cover crop shall not be harvested, grazed, or burned.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,195.96

**Scenario Cost/Unit:** $11.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 1 | $51.16 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** E340H - Cover crop to suppress excessive weed pressures and break pest cycles

**Scenario** #1 - Cover crop to suppress excessive weed pressures and break pest cycles

**Scenario Description:**

Establish a cover crop mix to suppress excessive weed pressures and break pest cycles. Select cover crop species for their life cycles, growth habits, and other biological, chemical and/or physical characteristics. Select cover crop species that do not harbor pests or diseases of subsequent crops in the rotation. Cover crop shall not be harvested, grazed, or burned.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,247.12

**Scenario Cost/Unit:** $12.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** E340I - Using cover crops for biological strip till

**Scenario** #6 - Using cover crops for biological strip till

**Scenario Description:**

Establish alternating strips of cover crops in which one strip acts as a biological strip-tiller and the adjacent strip promotes soil health with high residue cover crops. This will facilitate planting of the subsequent cash crop into the biologically strip-tilled row without the need for mechanical disturbance.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 340 - Cover Crop.

**After Situation:**

The adoption of this enhancement will provide protection above the minimum level as described in Conservation Practice Standard 340 - Cover Crop.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,400.60

**Scenario Cost/Unit:** $14.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 5 | $255.80 |
| **Materials** | | | | | | |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 20 | $1,144.80 |

**Practice:** E345A - Reduced tillage to reduce soil erosion

**Scenario** #1 - Reduced tillage to reduce soil erosion

**Scenario Description:**

Establish a reduced tillage system to reduce soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $529.12

**Scenario Cost/Unit:** $5.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E345B - Reduced tillage to reduce tillage induced particulate matter

**Scenario** #1 - Reduced tillage to reduce tillage induced particulate matter

**Scenario Description:**

Establish a reduced tillage system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $396.84

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E345C - Reduced tillage to increase plant-available moisture

**Scenario** #1 - Reduced tillage to increase plant-available moisture

**Scenario Description:**

Establish a reduced till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $396.84

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E345D - Reduced tillage to increase soil health and soil organic matter content

**Scenario** #1 - Reduced tillage to increase soil health and soil organic matter content

**Scenario Description:**

Establish a reduced till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $529.12

**Scenario Cost/Unit:** $5.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E345E - Reduced tillage to reduce energy use

**Scenario** #1 - Reduced tillage to reduce energy use

**Scenario Description:**

Establish a reduced tillage system which reduces total energy consumption associated with field operations by at least 25% compared to conventional tillage systems (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $396.84

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E373A - Dust suppressant re-application for stabilization

**Scenario** #22 - Dust Suppressant Re-application, Once per Year

**Scenario Description:**

Limit dust emissions by maintaining the surfaces of unpaved roads and areas in a stabilized condition. The periodic re-application of dust suppressants to unpaved surface areas will limit dust generation from vehicle and machinery activities or wind action.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 373 - Dust Control on Unpaved Roads and Surfaces.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 373 - Dust Control on Unpaved Roads and Surfaces.

**Feature Measure:** Square Feet

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 15,840.00

**Scenario Total Cost:** $5,174.69

**Scenario Cost/Unit:** $0.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 0.36 | $2.18 |
| Motor Grader, 200 HP | 1782 | Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor. | Hours | $168.36 | 3 | $505.08 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 3 | $149.43 |
| **Materials** | | | | | | |
| Chemical, dust control, road oil, petroleum-based | 1339 | Petroleum-based road oil, such as SC-250 or SC-800. Includes materials and shipping only. | Gallons | $5.02 | 900 | $4,518.00 |

**Practice:** E376A - Modify field operations to reduce particulate matter

**Scenario** #1 - Modify field operations to reduce particulate matter

**Scenario Description:**
Modify tillage and/or harvest operations to reduce particulates by at least 20 percent below the required levels.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $396.84

**Scenario Cost/Unit:** $3.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E381A - Silvopasture to improve wildlife habitat

**Scenario** #1 - Silvopasture to improve wildlife habitat

**Scenario Description:**

Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage, shade, and/or shelter for livestock that include a purpose of enhancing wildlife cover and shelter.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 381 - Silvopasture

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 381 - Silvopasture

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $8,439.34

**Scenario Cost/Unit:** $84.39

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 20 | $121.00 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 200 | $4,004.00 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 20 | $333.60 |
| Shrub, Seedling, Large | 1508 | Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only. | Each | $3.32 | 200 | $664.00 |
| Tree, Conifer, Seedling, Large | 1515 | Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only. | Each | $1.56 | 100 | $156.00 |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 20 | $2,538.20 |

**Practice:** E382A - Incorporating "wildlife friendly" fencing for connectivity of wildlife food resources

**Scenario** #1 - Incorporating "wildlife friendly" fencing for connectivity of wildlife food resources

**Scenario Description:**
Retrofitting or constructing fences that provide a means to control movement of animals, people, and vehicles, but minimizes wildlife movement impacts.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 382 - Fence

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 382 - Fence

**Feature Measure:** Acre

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $178.55

**Scenario Cost/Unit:** $0.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 1 | $18.55 |
| **Materials** | | | | | | |
| Vinyl Undersill Strips | 241 | Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only. | Feet | $0.08 | 2000 | $160.00 |

**Practice:** E382B - Installing electrical fence offsets and wire for cross-fencing to improve grazing management

**Scenario** #6 - Installing electrical fence offsets and wire for cross-fencing to improve grazing management

**Scenario Description:**
Retrofitting conventional fences such as barb wire, with new electrical offsets and electrical wire to facilitate cross-fencing for improved grazing management.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard 382 - Fence

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 382 - Fence

**Feature Measure:** Feet

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,640.00

**Scenario Total Cost:** $1,686.08

**Scenario Cost/Unit:** $0.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 16 | $818.56 |
| **Materials** | | | | | | |
| Wire, High Tensile, 12.5 Gauge, 4,000' roll | 2 | High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only. | Each | $178.27 | 1 | $178.27 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $15.19 | 3 | $45.57 |
| Electric, Insulated cable | 23 | Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only. | Each | $44.68 | 2 | $89.36 |
| Electric, Power Surge Protector | 24 | Electric, Power Surge Protector for electric fence. Includes materials and shipping only. | Each | $16.64 | 1 | $16.64 |
| Electric, Cutoff Switch | 25 | Electric, Cutoff Switch for electric fence. Includes materials and shipping only. | Each | $11.37 | 1 | $11.37 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $48.82 | 1 | $48.82 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $424.69 | 1 | $424.69 |
| Fence, Wire Assembly, High Tensile, Electric, 1 Strand | 32 | Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only. | Feet | $0.02 | 2640 | $52.80 |

**Practice:** E383A - Grazing-maintained fuel break to reduce the risk of fire

**Scenario** #1 - Grazing-maintained fuel break to reduce the risk of fire

**Scenario Description:**

The area has existing fuel break(s) of 30 to 60 feet in width, supporting a mixture of woody sprouts and some herbaceous vegetation. Warm-season perennial vegetation will be established on the fuel breaks, and will be over-seeded with cool-season annual forages in the fall. Grazing will be managed on the fuel breaks to remove or modify the fine fuel vegetation, thus reducing the risk of fire spread from ground fires. Ground cover will be maintained to control soil erosion and facilitate prescribed burning.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 383 - Fuel Break

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 383 - Fuel Break

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $3,284.62

**Scenario Cost/Unit:** $328.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $7.26 | 10 | $72.60 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 10 | $222.70 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| **Materials** | | | | | | |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 1000 | $1,020.00 |
| Annual Grasses, Legumes or Forbs | 2732 | A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $57.24 | 10 | $572.40 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 10 | $454.50 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E384A - Biochar production from woody residue

**Scenario** #7 - Biochar production from woody residue

**Scenario Description:**

The adoption of this enhancement will go above the minimum level of woody residue treatment by creating a product that improves air quality by storing carbon, decreases fuel loads and fire hazard, and can improves soil quality. It will utilize woody debris remaining after a silvicultural practice or natural disturbance to create biochar. Biochar stores carbon and is a useful soil amendment that improves SOM and water-holding capacity.

**Before Situation:**

Area has woody residue that is unmerchantable and available for creation of quality biochar. Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 384 - Woody Residue Treatment

**After Situation:**

Woody debri has been coverted to biochar.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $13,731.50

**Scenario Cost/Unit:** $6,865.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, .5 CY | 930 | Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included. | Hours | $89.72 | 40 | $3,588.80 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 40 | $266.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 15 | $370.50 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 80 | $1,000.00 |
| Biochar Kiln, open fire | 2681 | Open fire kiln or metal container used to produce biochar/charcoal production. Daily rental rate. Includes all material and equipment | Hours | $9.30 | 200 | $1,860.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 80 | $2,577.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 40 | $1,360.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E386A - Enhanced field borders to reduce soil erosion along the edge(s) of a field

**Scenario** #1 - Enhanced field borders to reduce soil erosion along the edge(s) of a field

**Scenario Description:**

Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover along the edge(s) of the field.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $681.25

**Scenario Cost/Unit:** $681.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2748 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $64.94 | 1 | $64.94 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E386B - Enhanced field borders to increase carbon storage along the edge(s) of the field

**Scenario** #1 - Enhanced field borders to increase carbon storage along the edge(s) of the field

**Scenario Description:**

Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover and dense rooting system along the edge(s) of the field.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $769.19

**Scenario Cost/Unit:** $769.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2756 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $152.88 | 1 | $152.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E386C - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

**Scenario** #1 - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

**Scenario Description:**
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that decrease the particulate emissions along the edge(s) of the field.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $700.72

**Scenario Cost/Unit:** $700.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, High Density | 2749 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping. | Acres | $84.41 | 1 | $84.41 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E386D - Enhanced field borders to increase food for pollinators along the edge(s) of a field

**Scenario** #1 - Enhanced field borders to increase food for pollinators along the edge(s) of a field

**Scenario Description:**
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide food for pollinators along the edge(s) of the field.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $769.19

**Scenario Cost/Unit:** $769.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2756 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $152.88 | 1 | $152.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E386E - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

**Scenario** #1 - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

**Scenario Description:**

Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide wildlife food and habitat along the edge(s) of the field. The extended field border will also provide enhanced wildlife habitat continuity.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $769.19

**Scenario Cost/Unit:** $769.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2756 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $152.88 | 1 | $152.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E390A - Increase riparian herbaceous cover width for sediment and nutrient reduction

**Scenario** #1 - Increase riparian herbaceous cover width for sediment and nutrient reduction

**Scenario Description:**

Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $1,149.41

**Scenario Cost/Unit:** $574.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 2 | $12.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 2 | $101.72 |
| Native Perennial Grasses, Medium Density | 2751 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $181.30 | 2 | $362.60 |

**Practice:** E390B - Increase riparian herbaceous cover width to enhance wildlife habitat

**Scenario** #1 - Increase riparian herbaceous cover width to enhance wildlife habitat

**Scenario Description:**

Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock, and increase the width of the buffer.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 4.00

**Scenario Total Cost:** $1,591.21

**Scenario Cost/Unit:** $397.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 4 | $24.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 2 | $44.54 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 1 | $356.07 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 1 | $306.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 4 | $203.44 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 2 | $540.74 |

**Practice:** E391A - Increase riparian forest buffer width for sediment and nutrient reduction

**Scenario** #1 - Increase riparian forest buffer width for sediment and nutrient reduction

**Scenario Description:**
Where an existing forested riparian area is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $4,245.10

**Scenario Cost/Unit:** $2,122.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 2 | $61.24 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 2 | $12.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 4 | $108.32 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 16 | $204.96 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 872 | $1,072.56 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 100 | $460.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 100 | $233.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E391B - Increase stream shading for stream temperature reduction

**Scenario** #1 - Increase stream shading for stream temperature reduction

**Scenario Description:**
Riparian area tree canopy cover density is increased and the extent of the forested riparian area is increased to provide greater stream shading.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $4,309.54

**Scenario Cost/Unit:** $2,154.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 2 | $61.24 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 2 | $12.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 4 | $108.32 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 16 | $204.96 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 18 | $579.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 872 | $1,072.56 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 100 | $460.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 100 | $233.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E391C - Increase riparian forest buffer width to enhance wildlife habitat

**Scenario** #1 - Increase riparian forest buffer width to enhance wildlife habitat

**Scenario Description:**

Where an existing riparian forest buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock to increase the functional width of the buffer.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $4,309.54

**Scenario Cost/Unit:** $2,154.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 2 | $61.24 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 2 | $12.10 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 4 | $108.32 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 16 | $204.96 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.82 | $291.98 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.72 | $220.50 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.46 | $115.97 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 18 | $579.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 4 | $136.08 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 872 | $1,072.56 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 100 | $460.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 100 | $233.00 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E393A - Extend existing filter strip to reduce water quality impacts

**Scenario** #1 - Extend existing filter strip to reduce water quality impacts

**Scenario Description:**

Extend existing filter strips for water quality protection. Extend the existing buffer for a total of 60 feet or more to enhance water quality functions. The extended buffers must be composed of at least 5 species of non-noxious, wildlife friendly grasses and/or perennial forbs best suited to site conditions. Include species that provide pollinator food and habitat where possible.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 393 - Filter Strip

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 393 - Filter Strip

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,033.75

**Scenario Cost/Unit:** $1,033.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acres | $13.21 | 1 | $13.21 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2756 | A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $152.88 | 1 | $152.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E395A - Stream habitat improvement through placement of woody biomass

**Scenario** #1 - Stream habitat improvement through placement of woody biomass

**Scenario Description:**

Flexible placement of wood (unanchored/unpinned) in small, 1st and 2nd order streams to improve stream habitat conditions for aquatic species and natural stream processes.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

**Feature Measure:** Bankfull width X Length

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $20,989.97

**Scenario Cost/Unit:** $20,989.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Hydraulic Excavator, 2 CY | 932 | Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included. | Hours | $133.05 | 16 | $2,128.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 8 | $842.24 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hours | $49.81 | 24 | $1,195.44 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $30.36 | 20 | $607.20 |
| Aggregate, Gravel, Graded | 46 | Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Cubic Yards | $31.15 | 30 | $934.50 |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $42.88 | 1 | $42.88 |
| Tree & Shrub, Woody, Cuttings, Large | 1309 | Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only. | Each | $12.18 | 300 | $3,654.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included. | Ton | $89.52 | 40 | $3,580.80 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.78 | 50 | $39.00 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 15 | $441.75 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $211.65 | 30 | $6,349.50 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $10.68 | 20 | $213.60 |
| **Mobilization** | | | | | | |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $480.13 | 2 | $960.26 |

**Practice:** E399A - Fishpond management for native aquatic and terrestrial species

**Scenario** #1 - Fishpond management for native aquatic and terrestrial species

**Scenario Description:**
Pond rehabilitation, buffer, and watershed management actions are taken to improve habitat for native species of fish, amphibians, and shorebirds.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 399 - Fishpond Management

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 399 - Fishpond Management

**Feature Measure:** Pond area + buffer area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $2,927.89

**Scenario Cost/Unit:** $1,463.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acres | $22.27 | 1 | $22.27 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 3 | $153.48 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 1 | $50.86 |
| Herbicide, Diquat dibromide | 1820 | Aquatic herbicide and plant growth regulator. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Gallons | $135.88 | 1 | $135.88 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $0.99 | 1000 | $990.00 |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 1 | $270.37 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E412A - Enhance a grassed waterway

**Scenario** #6 - Waterway, reshape/extend/widen

**Scenario Description:**

Typical practice is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding will be completed under the Critical Area Planting (342) Practice Standard with seeding area up to 20% greater than waterway area to account for buffer area along the waterway. Costs include excavation and associated work to construct the overall shape and grade of the waterway. This scenario would apply to Grassed Waterways without erosion control blanket or rock checks.

**Before Situation:**

The field has a grassed waterway, but a gully cutting upstream, downstream, or adjacent to the existing grassed waterway has formed as time goes on, so the new gully needs to be stopped or controlled. The new gully has formed in field as a result of a change in runoff amounts from the original design from subsurface drainage outlets, change in cropping techniques, change in land use, etc.

**After Situation:**

An installed grassed waterway has been installed that is possibly wider or longer than the original grassed waterway that wasn't functioning properly anymore. The new installed grassed waterway is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. The practice is installed using a dozer and/or scraper, with final grading with motor grader. Use Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606).

**Feature Measure:** Acres of Waterway reshaped, exte

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,229.30

**Scenario Cost/Unit:** $4,229.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yards | $0.91 | 411 | $374.01 |
| Excavation, common earth, large equipment, 150 ft | 1223 | Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor. | Cubic Yards | $3.85 | 954 | $3,672.90 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** E420A - Establish pollinator habitat

**Scenario** #6 - Establish Pollinator Habitat

**Scenario Description:**

Seed or plug nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $507.31

**Scenario Cost/Unit:** $507.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |

**Practice:** E420B - Establish monarch butterfly habitat

**Scenario** #6 - Establish Monarch Habitat

**Scenario Description:**

Seed or plug milkweed (Asclepias spp.) and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips and similar areas.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting.

**After Situation:**

Adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting.

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $853.50

**Scenario Cost/Unit:** $853.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 1 | $30.62 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acres | $9.09 | 1 | $9.09 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 1 | $442.87 |

**Practice:** E447A - Advanced Tailwater Recovery

**Scenario** #6 - Advanced Tailwater Recovery

**Scenario Description:**

This enhancement is for a recovery system that capture 100% of excess irrigation and drainage runoff water from the contiguous land where the activity is implemented. Runoff water is conveyed through properly designed recovery ditches to a storage structure. Each recovery ditch and storage structure have adequate capacity to store excess irrigation water and reasonable runoff water. The system is designed to incorporate the collected water back into the delivery system so that excess water is reused. The system is fully automated to operate the recovery pumps, valves, and collection system. Key elements in the system are sensors that can evaluate data and operate devices through the system in opening/closing or on /off based on scientifically determined parameters.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 447 - Irrigation System, Tailwater Recovery.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 447 - Irrigation System, Tailwater Recovery.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 200.00

**Scenario Total Cost:** $1,844.16

**Scenario Cost/Unit:** $9.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 24 | $445.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 24 | $773.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |

**Practice:** E449A - Complete pumping plant evaluation for water savings

**Scenario** #1 - Complete pumping plant evaluation for water savings

**Scenario Description:**

The performance of pump tests and evaluations of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more. Develop and provide a written report with recordkeeping documents and list of adjustments and calculations of the reduction of water use based on before and after conditions.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 – Irrigation Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 449 – Irrigation Water Management.

**Feature Measure:** Each pump evaluated

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,711.68

**Scenario Cost/Unit:** $4,711.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 32 | $4,232.96 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** E449C - Advanced Automated IWM - Year 2-5, soil moisture monitoring

**Scenario** #1 - Advanced Automated IWM - Year 2-5, soil moisture monitoring

**Scenario Description:**
Advanced automated irrigation water management using soil moisture or water level monitoring (installed as per IWM plan) with data loggers.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 – Irrigation Water Management

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 125.00

**Scenario Total Cost:** $3,330.64

**Scenario Cost/Unit:** $26.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 40 | $2,046.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 24 | $1,284.24 |

**Practice:** E449D - Advanced Automated IWM - Year 1, Equipment and soil moisture or water level monitoring

**Scenario** #1 - Advanced Automated IWM - Year 1, Equipment and soil moisture or water level monitoring

**Scenario Description:**
Installing and monitoring soil moisture or water leveling equipment for advanced automated irrigation water management

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 120.00

**Scenario Total Cost:** $7,143.52

**Scenario Cost/Unit:** $59.53

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 30 | $741.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Switches and Controls, temp sensors | 1192 | Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $697.95 | 3 | $2,093.85 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,660.98 | 1 | $1,660.98 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |

**Practice:** E449F - Intermediate IWM - Year 1, Equipment with Soil or Water Level monitoring

**Scenario** #6 - Intermediate IWM - Year 1, Equipment with Soil moisture or Water Level monitoring

**Scenario Description:**

This activity involves monitoring soil moisture or water levels within a irrigated field for intermediate irrigation water management include installation of equipment year 1.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $7,260.99

**Scenario Cost/Unit:** $45.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Switches and Controls, temp sensors | 1192 | Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $697.95 | 1 | $697.95 |
| Flow Meter, with mechanical Index | 1450 | 10 inch, Turbine Type Flow Meter with Mechanical Index, permanently installed. Includes materials and shipping only. | Each | $1,644.47 | 1 | $1,644.47 |
| Data Logger | 1453 | Data Logger W/Graphic Output for water management. Materials only. | Each | $693.70 | 4 | $2,774.80 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 12 | $773.16 |
| Weather Station, Advanced | 2550 | Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring . | Each | $853.13 | 1 | $853.13 |

**Practice:** E449G - Intermediate IWM - Years 2-5, Soil or Water Level monitoring

**Scenario** #6 - Intermediate IWM - Years 2-5, Soil Moisture or Water Level monitoring

**Scenario Description:**

Field currently flooded through a cascade levee system will be converted to furrow irrigation. It is required that field is leveed on the lower end and approximately 25% up the sides for furrow irrigation prior to implementing the enhancement. After the previous year's crop is harvested, elevated planting beds and furrows will be reshaped as needed to guarantee proper irrigation of the rice crop. Layflat tubing will be utilized with the correct holes or gates installed to advance water down the furrows at the appropriate rate across the length of the field as prescribed by an NRCS "PHAUCET" design, Delta Plastic® Pipe Planner® or similar.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 160.00

**Scenario Total Cost:** $1,837.60

**Scenario Cost/Unit:** $11.49

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 15 | $767.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 20 | $1,070.20 |

**Practice:** E449H - Intermediate IWM - Years 2 -5, using soil moisture or water level monitoring

**Scenario** #22 - Intermediate IWM - Years 2 - 5, using soil moisture or water level monitoring

**Scenario Description:**

Intermediate irrigation water management using soil moisture or water level monitoring with data loggers; specifically, multi-depth soil moisture sensors, water well and relift permanent flow meters, twice-daily water stage imaging water level devices, and quarter hour climate data element recording weather stations at approved IWM plan locations.

**Before Situation:**

Resources are protected at the minimum level of the CPS 449 - Irrigation Water Management.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $2,140.40

**Scenario Cost/Unit:** $53.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 40 | $2,140.40 |

**Practice:** E449I - Sprinkler Irrigation Equipment Retrofit

**Scenario** #22 - IWM - Year 1, Retrofit Equipment with Speed Control on Sprinkler Irrigation

**Scenario Description:**

This activity involves installing speed control equipment to a sprinkler irrigated field for irrigation water management. The installation of the equipment is in year one. It is applicable to sprinkler irrigation systems that do not already have the functionality and are able to integrate the speed control technology.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,997.10

**Scenario Cost/Unit:** $1,997.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| **Materials** | | | | | | |
| Center Pivot VRI, Speed Control | 2727 | Center pivot irrigation system using variable rate irrigation using speed control technology. Includes controller, sensors, GPS unit, and installation. | Number | $1,587.82 | 1 | $1,587.82 |

**Practice:** E449J - Intermediate IWM - 20% Reducing Water Usage

**Scenario** #6 - Intermediate IWM - 20% Reduced Water Usage

**Scenario Description:**

Intermediate irrigation water management involves monitoring soil moisture or water levels within an irrigated field by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment will be utilized to log data through the season to be retrieved periodically so irrigation decisions can be made based on scientific data. Maximum time between data retrieval is weekly. Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use. Supplimental Water usage will be reduced by 20% from previous years use and remain at that level for the remainder of the contract.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 – Irrigation Water Management.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 449 – Irrigation Water Management.

**Feature Measure:** Irrigated Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 125.00

**Scenario Total Cost:** $5,271.77

**Scenario Cost/Unit:** $42.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 32 | $4,232.96 |
| **Materials** | | | | | | |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $237.94 | 1 | $237.94 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor with 10 foot cables. Equipment only. | Each | $64.43 | 5 | $322.15 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** E472A - Manage livestock access to waterbodies to reduce nutrients or pathogens to surface water

**Scenario** #1 - Manage livestock access to waterbodies to reduce nutrients or pathogens to surface water

**Scenario Description:**

Installation of structures and implementation of grazing management actions that restrict livestock access to streams, ditches, and other waterbodies in order to reduce nutrient loading or reduce the introduction of pathogens from manure, bio-solids or compost to surface waters.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 472 - Access Control

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 472 - Access Control

**Feature Measure:** (Stream length protected * 2) + ((C

**Scenario Unit:** Feet

**Scenario Typical Size:** 1,320.00

**Scenario Total Cost:** $4,190.67

**Scenario Cost/Unit:** $3.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 5 | $48.05 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 5 | $123.50 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 5 | $135.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 33 | $1,063.26 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 5 | $170.10 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $135.85 | 4 | $543.40 |
| Post, Wood, CCA treated, 3-4 in. x 7 ft. | 9 | Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only. | Each | $11.38 | 20 | $227.60 |
| Post, Wood, CCA treated, 6 in. x 8 ft. | 12 | Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only. | Each | $25.77 | 8 | $206.16 |
| Post, Steel T, 1.33 lbs, 6 ft. | 15 | Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only. | Each | $7.85 | 90 | $706.50 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Feet | $0.21 | 1320 | $277.20 |
| Gate, Pipe, 12 ft. | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $260.18 | 2 | $520.36 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E484A - Mulching to improve soil health

**Scenario** #1 - Mulching to improve soil health

**Scenario Description:**

Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least 4 different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 - Mulching

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $264.56

**Scenario Cost/Unit:** $2.65

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |

**Practice:** E484B - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

**Scenario** #1 - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

**Scenario Description:**

Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch. At least 90% of all woody materials are to be used as mulch on the operation. An exception may be made when it is determined that infected material must be burned to preserve crop health.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 – Mulching

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

**Feature Measure:** Actual Acres of Crop producing Wo

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $786.88

**Scenario Cost/Unit:** $19.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |

**Practice:** E484C - Mulching with natural materials in specialty crops for weed control

**Scenario** #6 - Mulching with natural materials in specialty crops for weed control

**Scenario Description:**
Application of straw mulch or other state approved natural material (such as wood chips, compost, green chop, dry hay or sawdust) for weed control in specialty crops.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard 484 - Mulching

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 484 - Mulching

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $583.50

**Scenario Cost/Unit:** $58.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 2 | $54.16 |
| Mulcher, straw blower | 1305 | Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included. | Hours | $83.98 | 2 | $167.96 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 2 | $68.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $107.37 | 1.5 | $161.06 |

**Practice:** E511A - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

**Scenario** #1 - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

**Scenario Description:**

Harvest of crops (hay or small grains) using conservation measures that allow desired species to flush or escape. (For species list see State Wildlife Action Plan) Conservation measures include timing of harvest, idling land during the nesting or fawning period, and applying harvest techniques that reduce mortality to wildlife.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $251.83

**Scenario Cost/Unit:** $5.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Hay, General Grass | 2122 | General Grass Hay is Primary Land Use | Ton | $50.94 | 1.67 | $85.07 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |

**Practice:** E511B - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

**Scenario** #1 - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

**Scenario Description:**

The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such a way, and in time frames, to optimize both forage yield/quality and wildlife cover and shelter and/or continuity between otherwise disconnected habitats.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $554.01

**Scenario Cost/Unit:** $5.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 25 | $500.50 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** E511C - Forage testing for improved harvesting methods and hay quality

**Scenario** #6 - Hay quality record keepoing for livestock producers

**Scenario Description:**

This enhancement results in participants obtaining hay samples and submitting them to a land grant university or other accredited lab for quality analysis. The participant will record data for multiple harvests and use the data to make future decisions. The participant will discuss the results with NRCS or with their cooperative extensions service. Technical recommendations are made to the participant based upon the test results.

**Before Situation:**

The participant has hay that doesn't have quality analysis or doesn't know the quality of previous hay harvests. The hay will be fed when needed.

**After Situation:**

The participant has hay with hay quality analysis. The participant records data based upon the results to reference and make future decisions. The participant has a better understanding on the quality of hay so that adjustments in feeding or supplementation can be made.

**Feature Measure:** Each

**Scenario Unit:** Number

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $310.33

**Scenario Cost/Unit:** $155.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $30.05 | 2 | $60.10 |

**Practice:** E511D - Forage Harvest Management to Improve Terrestrial Habitat for Wildlife during Over-Winter Periods

**Scenario** #6 - Forage Harvest Management Overwinter

**Scenario Description:**

Eliminate or forgo the last fall cutting of hay or haylage to optimize wildlife cover and shelter during critical over-winter periods and lengthen late season bloom period for invertebrates. Allowing late season stand maturity increases stand life and reduces risks of frost and winter damage while providing valuable wildlife habitat and an extended bloom periods.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511-Forage Harvest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in CPS - 511

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $1,115.15

**Scenario Cost/Unit:** $27.88

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 3 | $189.99 |
| **Foregone Income** | | | | | | |
| FI, Hay, Alfalfa | 2121 | Alfalfa Hay is Primary Crop | Ton | $104.98 | 3 | $314.94 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 5 | $267.55 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |

**Practice:** E512A - Cropland conversion to grass-based agriculture to reduce soil erosion

**Scenario** #1 - Cropland conversion to grass-based agriculture to reduce soil erosion

**Scenario Description:**

Conversion of cropped land to grass-based agriculture to reduce soil erosion. Mixtures of perennial grasses, forbs, and legume species are established on cropland where annually-seeded cash crops have been grown.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,016.02

**Scenario Cost/Unit:** $10.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 20 | $909.00 |

**Practice:** E512B - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

**Scenario** #1 - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide for reduced soil erosion, improving soil health.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $2,645.22

**Scenario Cost/Unit:** $26.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 20 | $2,538.20 |

**Practice:** E512C - Cropland conversion to grass for soil organic matter improvement

**Scenario** #1 - Cropland conversion to grass for soil organic matter improvement

**Scenario Description:**

Conversion of cropped land to grass-based agriculture. Mixtures of perennial grasses, forbs, and/or legume species are established on cropland where annually-seeded cash crops have been grown.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,502.56

**Scenario Cost/Unit:** $15.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 20 | $909.00 |

**Practice:** E512D - Forage plantings that help increase organic matter in depleted soils

**Scenario** #1 - Forage plantings that help increase organic matter in depleted soils

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can help improve soil quality of depleted sites through increase or conservation of the organic matter in the soil.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,516.52

**Scenario Cost/Unit:** $15.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 25 | $500.50 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 20 | $909.00 |

**Practice:** E512E - Forage and biomass planting that produces feedstock for biofuels or energy production.

**Scenario** #1 - Forage and biomass planting that produces feedstock for biofuels or energy production.

**Scenario Description:**

Conversion of cropped land to grass-based agriculture. Mixtures of perennial grasses, forbs, and/or legume species are established on cropland where annually-seeded cash crops have been grown.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $6,610.06

**Scenario Cost/Unit:** $66.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 50 | $6,345.50 |

**Practice:** E512I - Establish pollinator and/or beneficial insect and/or monarch habitat

**Scenario** #1 - Establish pollinator and/or beneficial insect and/or monarch habitat

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for Monarch butterflies and/or pollinators and forage and other habitat values for wildlife and livestock, particularly at times when targeted nectar, forage supply and quality, cover, and shelter are not available in other pastures.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $2,968.26

**Scenario Cost/Unit:** $29.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Medium Density | 2754 | A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping. | Acres | $270.37 | 10 | $2,703.70 |

**Practice:** E512J - Establish wildlife corridors to provide habitat continuity or access to water

**Scenario** #1 - Establish wildlife corridors to provide habitat continuity or access to water

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide cover needed for wildlife species of concern to move from food/cover/water sources to other food/cover/water sources as needed for their life cycles, and/or to enhance the utility of underused wildlife habitat areas.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,876.62

**Scenario Cost/Unit:** $18.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 25 | $500.50 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Low Density | 2750 | Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $126.91 | 10 | $1,269.10 |

**Practice:** E512L - Diversifying Forage Base with Interseeding Forbs and Legumes to Increase Pasture Quality

**Scenario** #6 - Diversifying forage base with interseeding forbs and legumes to increase pasture quality.

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that increases the diversity to enhance livestock, forage supply and quality, not available in other pastures

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

**Feature Measure:** acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $4,506.44

**Scenario Cost/Unit:** $90.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 8 | $244.96 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 50 | $613.50 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 50 | $1,001.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Materials** | | | | | | |
| Introduced Perennial Grasses, Legumes and/or Forbs, Low Density | 2747 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping. | Acres | $45.45 | 50 | $2,272.50 |

**Practice:** E512M - Forage Plantings that Improve Wildlife Habitat Cover and Shelter or Structure and Composition

**Scenario** #6 - Forage plantings that improve wildlife habitat cover and shelter or structure and composition

**Scenario Description:**

Establishing native adapted and/or compatible species, varieties, or cultivars of herbaceous species for pasture, hay, or biomass production that provide cover and shelter or structure and composition for wilddlife.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $5,401.22

**Scenario Cost/Unit:** $54.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| **Materials** | | | | | | |
| Native Perennial Grasses, Legumes and/or Forbs, Low Density | 2753 | A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping. | Acres | $176.63 | 30 | $5,298.90 |

**Practice:** E528A - Maintaining quantity and quality of forage for animal health and productivity

**Scenario** #1 - Maintaining quantity and quality of forage for animal health and productivity

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired pasture composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity following the recommendations of a qualifying professional, as detailed in the documentation and implementation requirements.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $4,501.16

**Scenario Cost/Unit:** $4.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 36 | $720.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 17 | $547.74 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 1 | $62.53 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |
| Nutritional Balance Analyzer, fecal sample analysis only | 1127 | NIRS fecal analysis, animal performance report. Includes materials and shipping only. | Each | $47.39 | 6 | $284.34 |

**Practice:** E528B - Grazing management that improves monarch butterfly habitat

**Scenario** #1 - Grazing management that improves monarch butterfly habitat

**Scenario Description:**

Implement a grazing management plan that will increase the abundance and diversity of monarch nectar-producing perennial forbs, including milkweed, while maintaining ecosystem benefits for other wildlife and livestock.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,188.80

**Scenario Cost/Unit:** $11.89

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 2.5 | $50.05 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 1 | $32.22 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 1 | $62.53 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 2 | $882.16 |

**Practice:** E528C - Incorporating wildlife refuge areas in contingency plans for wildlife.

**Scenario** #1 - Incorporating wildlife refuge areas in contingency plans for wildlife.

**Scenario Description:**

A prescribed grazing plan that includes 12 month (or longer) rest (non-grazing period equal or greater than one year) of a grazing unit that consists of native grasses and/or legumes and/or perennial forbs for the purpose of meeting the needs for drought/disaster contingency plans that will also provide wildlife habitat or wildlife access to water for a period of time.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,945.95

**Scenario Cost/Unit:** $19.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 6 | $111.30 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 15 | $300.30 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 4 | $250.12 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |

**Practice:** E528D - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

**Scenario** #1 - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

**Scenario Description:**

Grazing management employed will provide the plant structure, density and diversity needed for improving the quantity and quality of cover, shelter and food for the desired wildlife species of concern.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $643.43

**Scenario Cost/Unit:** $0.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |

**Practice:** E528E - Improved grazing management for enhanced plant structure and composition for wildlife

**Scenario** #1 - Improved grazing management for enhanced plant structure and composition for wildlife

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving the quantity and quality of the structure and composition of the plant community that is available for wildlife.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $353.81

**Scenario Cost/Unit:** $3.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 15 | $300.30 |
| **Labor** | | | | | | |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** E528F - Stockpiling cool season forage to improve structure and composition or plant productivity and health

**Scenario** #1 - Stockpiling cool season forage to improve structure and composition or plant productivity and health

**Scenario Description:**

Grazing management employed to stop grazing events of selected paddock(s) to allow pasture forages to grow to maximum vegetative biomass accumulation before the end of the growing season.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $3,744.76

**Scenario Cost/Unit:** $37.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 6 | $111.30 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 10 | $200.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 1 | $62.53 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Nitrogen (N), Urea | 71 | Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed. | Pound | $1.02 | 2000 | $2,040.00 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 3 | $46.50 |

**Practice:** E528G - Improved grazing management on pasture for plant productivity and health with monitoring activities

**Scenario** #1 - Improved grazing management on pasture for plant productivity and health with monitoring activities

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a qualifying professional, as detailed in the enhancement criteria, generated through pasture condition scoring (PCS).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,145.22

**Scenario Cost/Unit:** $11.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 30 | $600.60 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |

**Practice:** E528H - Prescribed grazing to improve/maintain riparian and watershed function-elevated water temperature

**Scenario** #1 - Prescribed grazing to improve/maintain riparian and watershed function-elevated water temperature

**Scenario Description:**

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $1,908.74

**Scenario Cost/Unit:** $1.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 17 | $547.74 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 1 | $62.53 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |

**Practice:** E528I - Grazing management that protects sensitive areas -surface or ground water from nutrients

**Scenario** #1 - Grazing management that protects sensitive areas -surface or ground water from nutrients

**Scenario Description:**

Grazing management employed will provide cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations with plants that cannot tolerate defoliation.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $2,087.21

**Scenario Cost/Unit:** $2.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 17 | $547.74 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polytape | 7 | Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only. | Each | $60.25 | 4 | $241.00 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |

**Practice:** E528J - Prescribed grazing on pastureland that improves riparian and watershed function

**Scenario** #1 - Prescribed grazing on pastureland that improves riparian and watershed function

**Scenario Description:**

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,845.85

**Scenario Cost/Unit:** $18.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 6 | $111.30 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 10 | $200.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 4 | $250.12 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |

**Practice:** E528L - Prescribed grazing that improves or maintains riparian and watershed function-erosion

**Scenario** #1 - Prescribed grazing that improves or maintains riparian and watershed function-erosion

**Scenario Description:**

Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,241.36

**Scenario Cost/Unit:** $12.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 10 | $200.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 1 | $62.53 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |

**Practice:** E528M - Grazing management that protects sensitive areas from gully erosion

**Scenario** #1 - Grazing management that protects sensitive areas from gully erosion

**Scenario Description:**

Grazing management employed will provide vegetative cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations that cannot tolerate plant defoliation.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $1,906.46

**Scenario Cost/Unit:** $1.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 12 | $222.60 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 17 | $547.74 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| **Materials** | | | | | | |
| Wire, Polytape | 7 | Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only. | Each | $60.25 | 1 | $60.25 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 1 | $320.64 |

**Practice:** E528N - Improved grazing management through monitoring activities

**Scenario** #1 - Improved grazing management through monitoring activities

**Scenario Description:**

Three predominant key grazing areas are evaluated utilizing the Rangeland Health Assessment (where reference material is developed) or Describing Indicators of Rangeland Health protocols (where reference material is not developed) to determine how well the ecological processes of the site(s) are functioning. Utilizing knowledge learned from this as a part of the ranch resource assessment, a qualifying professional, as detailed in the enhancement criteria, will provide recommendations or follow-up evaluations toward mitigating some of the degradation risks that are initially identified.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1,000.00

**Scenario Total Cost:** $2,380.33

**Scenario Cost/Unit:** $2.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |

**Practice:** E528O - Clipping mature forages to set back vegetative growth for improved forage quality

**Scenario** #6 - Clipping mature forages to set back vegetative growth for improved forage quality

**Scenario Description:**

Timely clipping of mature forages through mowing, swathing or some other mechanical cutting will occur to increase forage palatability by setting plants back to a vegetative state for improved grazing management and forage quality.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 80.00

**Scenario Total Cost:** $3,349.63

**Scenario Cost/Unit:** $41.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 20 | $2,144.20 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 24 | $816.48 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** E528P - Implementing Bale or Swath Grazing to increase organic matter and reduce nutrients in surface water

**Scenario** #6 - Implementing bale or swath grazing to increase organic matter or reduce nutrients in surface water

**Scenario Description:**

Bale or swath grazing to improve organic matter, aggregate stability or soil organism habitat or to reduce nutrient risks to surface water by leaving field harvested forages on site or supplementing with off-field forages. Grazing forages in this manner, will help reduce nutrient concentrations from confined animal lots while incorporating organic matter, feeding and diversifying the microbiome, building better soil aggregation and increasing soil health.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $3,470.98

**Scenario Cost/Unit:** $173.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 20 | $494.00 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 20 | $1,266.60 |
| Trailer, flatbed, small | 1505 | Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $10.09 | 20 | $201.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 40 | $1,360.80 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 1 | $15.50 |

**Practice:** E528Q - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

**Scenario** #6 - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

**Scenario Description:**

Body condition scoring (BCS) serves as a useful management tool to monitor livestock performance with respect to current and recent feeding or grazing programs. Body condition scoring is a numeric scoring system, producers can use to consistently evaluate animals' estimated body energy reserves through degree of fatness. This information can be used to adjust nutritional strategies to reach optimal BCS. Since body condition is closely associated with reproductive performance as well as feed efficiency, monitoring body condition can help producers reach production goals and increase the operation's bottom line. Knowledge and understanding of BCS will assist producers to adjust a supplemental feeding program to maintain animal health and nutrition on a-monthly-basis.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $177.55

**Scenario Cost/Unit:** $1.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 1 | $18.55 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |

**Practice:** E528R - Management Intensive Rotational Grazing

**Scenario** #6 - Management Intensive Rotational Grazing

**Scenario Description:**

Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $4,727.96

**Scenario Cost/Unit:** $47.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 10 | $185.50 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 15 | $483.30 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only. | Each | $62.53 | 2 | $125.06 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $15.19 | 3 | $45.57 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $2.75 | 3 | $8.25 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $48.82 | 1 | $48.82 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $441.08 | 1 | $441.08 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $320.64 | 2 | $641.28 |
| Pipe, PE, 1 1/4 in., DR 9 | 998 | Materials: - 1 1/4 inch - PE - 160 psi - ASTM D3035 DR 9 | Feet | $1.64 | 1000 | $1,640.00 |

**Practice:** E528S - Soil Health Improvements on Pasture

**Scenario** #6 - Soil health improvements on pasture

**Scenario Description:**

Use of soil health assessment to evaluate impact of current grazing system in addressing soil organic matter depletion, soil aggregate instability and soil organism habitat loss or degradation (primary assessment made in Year 1). Modifications to the grazing system will be made after the laboratory analysis. Modifications can be improvements to the grazing plan or changes to the forage composition. During year 4, a follow-up assessment will be completed to allow time for the modifications to show improvements to the soil health resource concerns. The follow-up sample will be taken in the same soil type, closely matched to time of year and with similar amounts of regrowth since previous grazing.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (PCS) 528 - Prescribed Grazing

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,113.37

**Scenario Cost/Unit:** $11.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $20.02 | 12 | $240.24 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 6 | $321.06 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 1 | $132.28 |
| **Materials** | | | | | | |
| Test, Soil Health, Basic Package | 2734 | Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling. | Number | $131.91 | 1 | $131.91 |

**Practice:** E528T - Grazing to Reduce Wildfire Risk on Forests

**Scenario** #6 - Improved grazing management for reduction of wildfire risks on Western forests

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of balancing forage with maintaining/improving ecological site condition and while reducing the risk of wildfire hazard on forested ecological sites.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level with the addition of CPS 528 - Prescribed Grazing

**Feature Measure:** acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $155.83

**Scenario Cost/Unit:** $1.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 1 | $53.51 |

**Practice:** E533A - Advanced Pumping Plant Automation

**Scenario** #6 - Advanced Pumping Plant Automation

**Scenario Description:**

This enhancement consists of installing a control device to a pump station that allows the user to remotely monitor and operate the pump station based on field measured data. Pumping stations may have either a combustible or electric power unit that are compatible with the control device or sensor. These devices/sensors collect field-measured data and provide this data in real time to the landowner to make irrigation decisions and adjustments to the pump operation.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 533 - Pumping Plant.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 533 - Pumping Plant.

**Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $8,470.40

**Scenario Cost/Unit:** $8,470.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 0.1 | $79.47 |
| Switches and Controls, temp sensors | 1192 | Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $697.95 | 1 | $697.95 |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $528.75 | 1 | $528.75 |
| Switches and Controls, Wi-Fi system and software | 1194 | Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems | Each | $828.75 | 1 | $828.75 |
| Switches and Controls, radio system | 1195 | Output radio, field transmitter, and receiver commonly used to control pumps and irrigation systems | Each | $486.32 | 1 | $486.32 |
| Data Logger with Telemetry System | 1454 | Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only. | Each | $1,660.98 | 1 | $1,660.98 |
| Safety Camera on Automated Pump | 2474 | Waterproof outdoor wireless IP Network security camera with housing. Includes materials only. | Each | $227.16 | 1 | $227.16 |
| Engine/Fuel Tank Sensor | 2487 | Transducer and sensors to monitor the oil pressure, oil and water temperatures, fuel flow meter with digital pulse output and fuel levels in a tank. Includes the conduit and cabling. | Each | $35.78 | 1 | $35.78 |

**Practice:** E533B - Complete pumping plant evaluation for energy savings

**Scenario** #1 - Complete pumping plant evaluation for energy savings

**Scenario Description:**

The performance of pump tests and evaluations of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to reduce energy use. Evaluate to determine if a Variable Frequency Drive motor controller(s) will reduce energy use and is feasible. Develop and provide a written report with list of adjustments and calculations of the reduction of energy use based on before and after conditions.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 - Pumping Plant

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 533 - Pumping Plant

**Feature Measure:** Each pump evaluated

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $4,711.68

**Scenario Cost/Unit:** $4,711.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 32 | $4,232.96 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** E533C - Install VFDs on pumping plants

**Scenario** #9 - Install variable frequency drive on pump

**Scenario Description:**
Install Variable Frequency Drive(s) (VFD) on Pumping Plant with the correct sensors, on all pumps as indicated in the evaluation.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 – Pumping Plant.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 533 – Pumping Plant.

**Feature Measure:** Each pump modified

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $7,304.28

**Scenario Cost/Unit:** $7,304.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Variable Speed Drive, 50 HP | 1288 | Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only. | Horsepower | $126.54 | 50 | $6,327.00 |

**Practice:** E533D - Switch fuel source for pumps

**Scenario** #9 - Switch fuel source for pumps

**Scenario Description:**
Switch the fuel source for pump motor(s) to an on-farm renewable source (wind, solar, geothermal, etc.)

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 – Pumping Plant.

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 533 – Pumping Plant.

**Feature Measure:** Each pump modified

**Scenario Unit:** Number

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $11,314.46

**Scenario Cost/Unit:** $11,314.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 4 | $98.80 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 12 | $613.92 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Pump, <= 5 HP, pump and motor, fixed cost portion | 1009 | Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only. | Each | $1,309.33 | 1 | $1,309.33 |
| Pump, <= 5 HP, pump and motor, variable cost portion | 1010 | Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only. | Horsepower | $418.15 | 5 | $2,090.75 |
| Solar Panels, fixed cost portion | 1031 | Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment. | Each | $2,963.80 | 1 | $2,963.80 |
| Solar Panels, variable cost portion | 1135 | Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only. | Kilowatt | $794.66 | 5 | $3,973.30 |

**Practice:** E570A - Enhanced rain garden for wildlife

**Scenario** #6 - Enhanced rain garden for wildlife

**Scenario Description:**
Seed or plug nectar and pollen producing plants into rain gardens to provide wildlife habitat.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard 570 - Stormwater Runoff Control

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 570 - Stormwater Runoff Control

**Feature Measure:** Square Feet

**Scenario Unit:** Square Feet

**Scenario Typical Size:** 1,080.00

**Scenario Total Cost:** $240.83

**Scenario Cost/Unit:** $0.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Site Preparation, Mechanical | 944 | Aerator, rolling drum chopper, etc. Includes equipment, power unit and labor costs. | Acres | $95.23 | 0.1 | $9.52 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.1 | $1.23 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $107.37 | 0.3 | $32.21 |
| Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability | 2619 | Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping. | Acres | $442.87 | 0.1 | $44.29 |

**Practice:** E578A - Stream crossing elimination

**Scenario** #1 - Stream crossing elimination

**Scenario Description:**
Existing stream crossings on an operation are consolidated into fewer crossings in order to reduce impacts to stream habitat.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 578 - Stream Crossing

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 578 - Stream Crossing

**Feature Measure:** Typical feature is 0.09 acres

**Scenario Unit:** Each

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $9,516.94

**Scenario Cost/Unit:** $9,516.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $73.49 | 16 | $1,175.84 |
| Hydraulic Excavator, 1 CY | 931 | Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included. | Hours | $125.11 | 8 | $1,000.88 |
| Seeding Operation, Broadcast, Ground | 959 | Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs. | Acres | $12.27 | 0.1 | $1.23 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hours | $105.28 | 16 | $1,684.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 32 | $1,031.04 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 32 | $1,088.64 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 16 | $856.16 |
| **Materials** | | | | | | |
| Erosion Control Blanket, biodegradable | 1213 | Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only. | Square Yard | $1.70 | 300 | $510.00 |
| Tree & Shrub, Woody, Cuttings, Medium | 1308 | Woody cuttings, live stakes or whips typically 1/4 to 1 inch diameter and 24 to 48 inches long. Includes materials and shipping only. | Each | $1.67 | 300 | $501.00 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included. | Ton | $29.45 | 42 | $1,236.90 |
| Annual Grasses | 2730 | Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping. | Acres | $36.68 | 0.1 | $3.67 |
| Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density | 2748 | Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping. | Acres | $64.94 | 0.1 | $6.49 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E580A - Stream corridor bank stability improvement

**Scenario** #1 - Stream corridor bank stability improvement

**Scenario Description:**
Stream corridor bank vegetation components are established to provide additional streambank stability.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $4,693.08

**Scenario Cost/Unit:** $2,346.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 8 | $102.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 65 | $443.30 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 65 | $304.20 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 65 | $416.00 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.26 | 65 | $81.90 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $2.49 | 65 | $161.85 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 65 | $299.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 195 | $454.35 |

**Practice:** E580B - Stream corridor bank vegetation improvement

**Scenario** #1 - Stream corridor bank vegetation improvement

**Scenario Description:**
Stream corridor bank vegetation components are established to improve ecosystem functioning and stability.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

**Feature Measure:** Area planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 2.00

**Scenario Total Cost:** $4,693.08

**Scenario Cost/Unit:** $2,346.54

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 8 | $148.40 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 8 | $109.36 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 8 | $102.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 8 | $428.08 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 65 | $443.30 |
| Tree, Hardwood, Potted, Small | 1529 | Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $4.68 | 65 | $304.20 |
| Tree, Conifer, Potted, Small | 1534 | Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.40 | 65 | $416.00 |
| Tree shelter, mesh tree tube, 48 in. | 1556 | 48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.26 | 65 | $81.90 |
| Tree shelter, solid tube type, 4 in. x 24 in. | 1563 | 4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $2.49 | 65 | $161.85 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 65 | $299.00 |
| Stakes, wood, 1 in. x 1 in. x 48 in. | 1578 | 1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.33 | 195 | $454.35 |

**Practice:** E590A - Improving nutrient uptake efficiency and reducing risk of nutrient losses

**Scenario** #1 - Improving nutrient uptake efficiency and reducing risk of nutrient losses

**Scenario Description:**

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses to surface and groundwater and reduce risks to air quality by reducing emissions of greenhouse gases (GHGs).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,363.36

**Scenario Cost/Unit:** $13.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acres | $10.47 | 100 | $1,047.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $10.36 | 5 | $51.80 |

**Practice:** E590B - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

**Scenario** #1 - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

**Scenario Description:**

Precision application technology and techniques are utilized to plan and apply nutrients to improve nutrient use efficiency and reduce risk of nutrient losses.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,699.06

**Scenario Cost/Unit:** $16.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 100 | $892.00 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 35 | $542.50 |

**Practice:** E590C - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

**Scenario** #6 - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

**Scenario Description:**

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses on pasture.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 590 - Nutrient Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 590 - Nutrient Management

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $2,041.12

**Scenario Cost/Unit:** $20.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 100 | $892.00 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 40 | $620.00 |

**Practice:** E590D - Reduce nutrient loss by increasing setback awareness via precision technology for water quality

**Scenario** #6 - Reduce risks of nutrient losses to surface and groundwater by increasing setback awareness via precision technology

**Scenario Description:**

Precision technology and techniques are used to increase Soil/Groundwater Setbacks & Associated Application Rate Restrictions (SGS&AARR) implementation during nutrient application by providing precise, real-time location information (geo-located) in the field to the equipment operator. While operating nutrient application equipment, the operator's location is continually updated and displayed on an add-on GPS-enabled device visible to the operator at all times to reduce the risk of nutrient application in setback and/or sensitive areas. Resource concerns addressed are Water Quality, Field sediment, nutrient and pathogen loss: Nutrients transported to groundwater and surface water and Pathogens and chemicals from manure, biosolids or compost applications transported to groundwater and surface water.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management.

**Feature Measure:** Acres with setback for nutrient app

**Scenario Unit:** Acres

**Scenario Typical Size:** 300.00

**Scenario Total Cost:** $4,239.70

**Scenario Cost/Unit:** $14.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 2 | $216.66 |
| **Equipment Installation** | | | | | | |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $8.92 | 300 | $2,676.00 |
| Aerial Imagery | 966 | Aerial imagery. RBG (color), infrared or NDVI single image. | Acres | $1.85 | 260 | $481.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E595A - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

**Scenario** #1 - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

**Scenario Description:**

Utilize precision application techniques to reduce risk of pesticides in surface water by reducing total amount of chemical applied and reducing the potential for delivery of chemicals into water bodies.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,327.84

**Scenario Cost/Unit:** $13.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, precision application | 949 | Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acres | $9.31 | 100 | $931.00 |
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E595B - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

**Scenario** #1 - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

**Scenario Description:**

Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce risk of pesticides in water and air. Reduce the potential for delivery of chemicals into water or ozone precursor emissions .

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $908.44

**Scenario Cost/Unit:** $9.08

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 3 | $396.84 |

**Practice:** E595D - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

**Scenario** #1 - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

**Scenario Description:**

Bacillus thuringiensis (Bt) plant incorporated protectants are plants that have been genetically altered to produce proteins that are harmful to certain insect pests. Widespread implementation of Bt crops has decreased insecticide use and increased crop yields, but it must be used as part of an integrated pest management (IPM) approach to protect the crop from pest species that are not susceptible to the Bt toxin and to manage pest resistance. Crop rotation, scouting and resistance management strategies, such as planting and creating refuges of non-Bt crops, are essential when farming Bt crops. Insects have developed resistance to Bt proteins. To mitigate the development of further resistance, growers are required to plant refuges of non-transgenic crops. These refuges produce numbers of susceptible insects that will help sustain populations of non-resistant insects. The size of Refuge requirement depends on the environment, pest and strain of the crop. Size of refuge is determined by resistance risk. Most Bt corn requires that 20% of the total Bt crop planted be non-Bt. Cotton can require 50% of the crop be planted to non-Bt. A recent study published in the Journal of Integrated Pest Management revealed, compliance has been a challenge. Nearly 40% of growers surveyed did not plant the required refuge (Reisig 2017). They credit non-compliance, in part, to lack of understanding by small-scale farmers about the need for refuges.

**Before Situation:**

Minimal or no refuges were planted as required for Bt crops.

**After Situation:**

Optimum sized and located refuges are planted for Bt crops.

**Feature Measure:** Ac

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $776.16

**Scenario Cost/Unit:** $19.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |

**Practice:** E595E - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

**Scenario** #1 - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

**Scenario Description:**

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental effect on dung beetle populations. Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest control in and on livestock along with rotational grazing and higher stock densities has shown to increase the dung beetle population. Use of natural or alternative methods of pest control over multiple years is encouraged.

**Before Situation:**

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental

**After Situation:**

Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 500.00

**Scenario Total Cost:** $3,597.56

**Scenario Cost/Unit:** $7.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 26 | $482.30 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 10 | $511.60 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 10 | $535.10 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 12 | $1,587.36 |

**Practice:** E595F - Improving Soil Organism Habitat on Agricultural Land

**Scenario** #6 - Improving soil organism habitat on agricultural land

**Scenario Description:**

To reduce or eliminate the use of seed treatments in corn and soybean cropping systems to promote beneficial organism populations and pest control. Beneficial organisms such as the Carabidae beetle are very important in the population control of common agricultural pests like the grey garden slug. Slugs are a common pest in no-till and heavily cover cropped fields. Slugs are mollusks and can ingest some treatments with no adverse effects. Beneficial organism populations can be negatively impacted when they consume slugs exposed to seed treatments. The reduction or elimination of routine seed treatments in these cash crop systems may increase beneficial insect populations.

**Before Situation:**

Seed treatments are used on crops.

**After Situation:**

Producers effectively reduce or eliminate seed treatment use in their cropping rotations either by eliminating seed treatments on corn-soybean rotations or eliminating seed treatments on corn.

**Feature Measure:** Acres Planted

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $661.40

**Scenario Cost/Unit:** $13.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E595G - Reduced resistance risk by utilizing PAMS techniques

**Scenario** #6 - Reduced resistance risk by utilizing PAMS techniques

**Scenario Description:**

Design and implementation of an integrated pest management plan that will Utilize integrated pest management (IPM) prevention, avoidance, monitoring, and suppression (PAMS) techniques to reduce pesticide resistance and address plant pest pressure. Increased resistance leads to increased use of more toxic pesticides and increased risk of delivery of chemicals to water or ozone precursor emissions.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 – Pest Management Conservation Systems

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level described in Conservation practice Standard (CPS) 595 Pest Management Conservation System.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,777.01

**Scenario Cost/Unit:** $17.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Acquisition of Technical Knowledge** | | | | | | |
| Training, Workshops | 294 | Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants. | Each | $108.33 | 1 | $108.33 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 4 | $74.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |

**Practice:** E612B - Planting for high carbon sequestration rate

**Scenario** #7 - Planting for high carbon storage rate

**Scenario Description:**

Plant tree species and use stocking levels for higher growth to increase the rate of carbon sequestration (capture). Use species with a longer life span as well as relatively fast growth, and species suitable for durable manufactured products. Increase stocking levels in forests that are not fully stocked. Implement afforestation on appropriate open lands.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $4,065.89

**Scenario Cost/Unit:** $813.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 7 | $172.90 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 5 | $30.25 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 5 | $329.05 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 35 | $448.35 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 35 | $1,127.70 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 7 | $374.57 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 5 | $83.40 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 5 | $77.85 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 5 | $11.20 |
| Tree, Hardwood, Seedling, Small | 1509 | Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only. | Each | $0.82 | 1075 | $881.50 |

**Practice:** E612C - Establishing tree/shrub species to restore native plant communities

**Scenario** #1 - Establishing tree/shrub species to restore native plant communities

**Scenario Description:**

Establish trees and/or shrubs to restore elements of plant diversity that have been lost through past diseases or improper management. For example, disease-resistant varieties of elm and chestnut can be established to restore the ecological functions of American elm and American chestnut. At the stand level, past forest management may have eliminated certain native tree species. Restoring stand-level diversity and function addresses a wide array of resource concerns and strengthens ongoing management activities. This enhancement improves a forest that is already in good condition by increasing plant diversity, and improving health and vigor through adding plants with resistance to disease, pests, or other local hazards. Additional benefits include contributing to carbon storage, and providing diversity in wildlife habitat and food sources.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $4,754.88

**Scenario Cost/Unit:** $950.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 12 | $153.72 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 12 | $386.64 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Shrub, Potted, Small | 1524 | Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only. | Each | $6.82 | 50 | $341.00 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 100 | $1,241.00 |
| Tree, Conifer, Potted, Medium | 1537 | Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.08 | 100 | $1,208.00 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 150 | $846.00 |

**Practice:** E612D - Adding food-producing trees and shrubs to existing plantings

**Scenario** #1 - Adding food-producing trees and shrubs to existing plantings

**Scenario Description:**
Plant food-producing trees and shrubs for wildlife or human consumption within windbreaks, alley cropping, multi-story cropping, silvopasture systems, and/or riparian forest buffers.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $2,074.01

**Scenario Cost/Unit:** $207.40

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 10 | $185.50 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 10 | $128.10 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 341 | $446.71 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 340 | $418.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E612E - Cultural plantings

**Scenario** #1 - Cultural plantings

**Scenario Description:**

Plant trees and shrubs that are of cultural significance, such as those species utilized by Tribes in traditional practices, medicinal plants, species used in basket-making, etc. (e.g., paper birch, slippery elm, witch hazel).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,861.23

**Scenario Cost/Unit:** $1,861.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 10 | $128.10 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 681 | $837.63 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E612F - Sugarbush management

**Scenario** #1 - Sugarbush management

**Scenario Description:**

Establish or maintain species diversity in a sugarbush to enhance pollinator and wildlife needs. Maintain at least 20% of basal area in species other than sugar maple (Acer saccharum) to provide species diversity. Half of the trees that are not sugar maples (10%) will be mast producing species (hard or soft mass). Use maple tree tapping guidelines that minimize tree damage.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $898.67

**Scenario Cost/Unit:** $898.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 1 | $65.81 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 2 | $25.62 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 0.5 | $8.34 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 20 | $248.20 |
| Tree shelter, solid tube type, 4 in. x 60 in. | 1567 | 4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $5.64 | 20 | $112.80 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.07 | 60 | $4.20 |
| Stakes, wood, 3/4 in. x 3/4 in. x 60 in. | 1583 | 3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.44 | 20 | $48.80 |

**Practice:** E612G - Tree/shrub planting for wildlife food

**Scenario** #1 - Tree/shrub planting for wildlife food

**Scenario Description:**

Tree or shrub planting to enhance habitat for native wildlife. A minimum of five tree or shrub species will be used; they will be species that provide food and/or cover for identified wildlife species.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,960.18

**Scenario Cost/Unit:** $1,960.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acres | $6.05 | 1 | $6.05 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 11 | $140.91 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acres | $356.07 | 0.41 | $145.99 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acres | $306.25 | 0.36 | $110.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acres | $252.11 | 0.23 | $57.99 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 11 | $354.42 |
| **Materials** | | | | | | |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $16.68 | 1 | $16.68 |
| Herbicide, Sulfometuron & metsulfuron | 344 | A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $15.57 | 1 | $15.57 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| Shrub, Seedling, Medium | 1507 | Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.31 | 605 | $792.55 |
| Tree, Hardwood, Seedling, Medium | 1510 | Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only. | Each | $1.23 | 218 | $268.14 |

**Practice:** E643A - Restoration of sensitive coastal vegetative communities

**Scenario** #1 - Restoration of sensitive coastal vegetative communities

**Scenario Description:**

Enhance the level of restoration in unique and diminishing coastal ecosystems by establishing native herbaceous and woody plants. Protect established vegetation, and manage to maintain floristic quality and the provision of environmental services. This enhancement is applied on unique areas with rare and declining habitat conditions, where vegetation has been detrimentally altered by human or natural events. Targeted sites are those that formerly supported vegetative communities that are now declining and/or becoming rare. The sites will vary across the continent. The enhancement will expand and elevate the process of restoring these unique areas, increasing their ecological value and benefits to wildlife. It re-establishes a select group of trees and/or shrubs that are key components in this ecosystem.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

**Feature Measure:** Each

**Scenario Unit:** Each

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $3,895.97

**Scenario Cost/Unit:** $155.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 8 | $462.80 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hours | $12.81 | 8 | $102.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 2 | $107.02 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 7 | $925.96 |
| **Materials** | | | | | | |
| Post, Steel T, 1.33 lbs, 6 ft. | 15 | Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only. | Each | $7.85 | 50 | $392.50 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 5 | $52.15 |
| Cattle Panel | 1409 | Welded wire cattle panel typically 1/4 inch galvanized steel rods, 50 in. high x 16 ft. long. Materials only. | Each | $33.75 | 25 | $843.75 |
| Tree, Hardwood, Potted, Medium | 1532 | Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only. | Each | $12.41 | 25 | $310.25 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E643B - Restoration and management of rare or declining habitat

**Scenario** #1 - Restoration and management of rare or declining habitat

**Scenario Description:**
Provide protection from adverse environmental conditions to create refugia for documented occurrences of sensitive plant communities.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

**Feature Measure:** Feet of Fence

**Scenario Unit:** Feet

**Scenario Typical Size:** 440.00

**Scenario Total Cost:** $4,582.02

**Scenario Cost/Unit:** $10.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hours | $9.61 | 8 | $76.88 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 8 | $197.60 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hours | $27.08 | 8 | $216.64 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 2 | $264.56 |
| **Materials** | | | | | | |
| Wire, Woven, Galvanized, 12.5 Gauge, 48 inch | 4 | Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only. | Each | $366.93 | 3 | $1,100.79 |
| Post, Wood, CCA treated, 6 in. x 12-14 ft. | 13 | Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only. | Each | $39.56 | 38 | $1,503.28 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Feet | $0.15 | 1648 | $247.20 |
| Gate, Game, 8 ft. High X 4 ft. Wide | 1082 | 4 Foot wide game gate (8 feet tall). Includes materials and shipping only. | Each | $277.11 | 1 | $277.11 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E643C - Restore glade habitat to benefit threatened and endangered species and state species of concern

**Scenario** #6 - Restore glade habitat to benefit threatened and endangered species and state species of concern

**Scenario Description:**

Restore Glade natural communities as shown by the Ecological Site Description to conserve biodiversity. Enhancement requires reducing woody canopy cover and applying at least one prescribed fire to treated acres. Restoration of glade communities provide habitat for rare and declining species. Sites that previously or currently support the rare and declining habitat will be targeted for restoration.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 643 - Restoration of Rare or Declining Habitat.

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 643 - Restoration of Rare or Declining Habitat.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 5.00

**Scenario Total Cost:** $7,825.78

**Scenario Cost/Unit:** $1,565.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hours | $57.85 | 2 | $115.70 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 80 | $532.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2.5 | $61.75 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 1.5 | $98.72 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 22 | $408.10 |
| Water tank, portable | 1602 | Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only. | Hours | $12.50 | 2 | $25.00 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 116 | $5,934.56 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hours | $53.51 | 4 | $214.04 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 0.5 | $19.61 |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallons | $5.19 | 5 | $25.95 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 2 | $138.88 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 1 | $251.47 |

**Practice:** E644A - Managing Flood-Irrigated Landscapes for Wildlife

**Scenario** #1 - Managing Flood-Irrigated Landscapes for Wildlife

**Scenario Description:**

Developing and implementing a conservation plan that supports maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 644 – Wetland Wildlife Habitat Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 644 – Wetland Wildlife Habitat Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $1,592.54

**Scenario Cost/Unit:** $31.85

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 9 | $222.30 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 22 | $708.84 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E645A - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

**Scenario** #1 - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

**Scenario Description:**

Reduction of artificial perching sites, nest sites, food, and water available to subsidized predators in areas where human-subsidized predators are a threat to sensitive wildlife species. Human-subsidized predators may include ravens, crows, magpies, coyotes, foxes, skunks, raccoons, and other species. Activities under this enhancement may include removal of non- native or invasive trees; removal of unused power poles, corrals, windmills, buildings, and other vertical structures; and/or removal or management of watering facilities, dead livestock, road kill, garbage, animal feed, dumps, and other non-natural food sources.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

**Feature Measure:** Acre

**Scenario Unit:** Number

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $2,467.44

**Scenario Cost/Unit:** $61.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 24 | $592.80 |
| Trailer, enclosed, small | 1503 | Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included. | Hours | $13.67 | 24 | $328.08 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 48 | $1,546.56 |

**Practice:** E645B - Manage existing shrub thickets to provide adequate shelter for wildlife

**Scenario** #6 - Manage existing shrub thickets to provide adequate shelter for wildlife

**Scenario Description:**

Existing shrub thickets provide an instant and important cover for wildlife. Various wildlife species may use shrubs as winter/thermal cover, summer shade, roosting, or as escape cover from predators. Proper management ensures that these shrubs will continue to provide the desired benefits for the local wildlife. A combination of herbicide treatments, cutting and trimming branches, and removal of other competing vegetation will occur. An eligible existing shrub thicket needs to have a canopy cover of 750 square feet, with an end goal of expanding to 1500 square feet. Any existing shrub thicket (not hand planted within the last 5 years) are eligible for this enhancement. Shrub thickets found within fence rows may now be very wide, but still meet the 750 square feet, are eligible.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $371.74

**Scenario Cost/Unit:** $371.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 2 | $13.30 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hours | $2.35 | 2 | $4.70 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 2 | $102.32 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 1 | $50.86 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 1 | $2.24 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** E645C - Edge feathering for wildlife cover

**Scenario** #6 - Edge feathering for wildlife cover

**Scenario Description:**

Selected trees are cut and brush clipped along the border between a wooded area and a grassland, cropland, or idle land, creating a dense woody cover of interlocking branches at ground level. The feathered edge will be an average of 30 feet wide and a minimum of 50 feet long, resulting in an area of 1500 square feet. The width of the strip will vary to follow topographic features and to create a wavy border; the design will also consider aesthetics. Vegetative composition and cover will vary within the edge, ranging from areas with no trees and shrubs to areas with scattered trees and extensive shrub cover. The variation in vegetation structure along with variable width of the edge will create feathering. The edge may include shrub plantings for wildlife food and aesthetics.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 1.00

**Scenario Total Cost:** $1,024.96

**Scenario Cost/Unit:** $1,024.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8 | $53.20 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 2 | $131.62 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 8 | $409.28 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 2 | $64.44 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 1 | $39.22 |
| **Mobilization** | | | | | | |
| Mobilization, very small equipment | 1137 | Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously. | Each | $69.44 | 1 | $69.44 |

**Practice:** E645D - Wildlife Habitat Management Plan for Upland Landscapes

**Scenario** #7 - Wildlife Habitat Management Plan for Upland Landscapes

**Scenario Description:**

Develop and implement a wildlife habitat management plan that removes or significantly reduces the impact of existing land management activities occurring within agricultural landscapes (on any land use) causing chronic disturbance to wildlife during breeding, rearing, migration and over- wintering periods. Site monitoring may be necessary to identify and document sources of disturbance to wildlife. Examples of adjustments to existing management activities that can reduce disturbance to a tolerable level include: use of integrated pest management; capping of open vertical pipes; provision of wildlife-friendly water access and egress; and reduction of noise or movement within key migratory, nesting, rearing, loafing or hiding locations.

**Before Situation:**

The inadequate terrestrial wildlife habitat concern has been addressed under Conservation Practice Standard 645 and minimum planning criteria for the terrestrial wildlife habitat resource concern has been met. However, disturbance related impacts tied to the agricultural operation are negatively impacting wildlife.

**After Situation:**

Land management activities occurring within the agricultural landscape (on any land use) have been adjusted to avoid causing chronic disturbance to wildlife during breeding, rearing, migration and over- wintering periods has been addressed. Planning criteria for the terrestrial wildlife habitat resource concern exceeds minimum planning criteria.

**Feature Measure:** Acres of Improved Habitat

**Scenario Unit:** Acres

**Scenario Typical Size:** 40.00

**Scenario Total Cost:** $446.97

**Scenario Cost/Unit:** $11.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 3 | $74.10 |
| Rangeland/grassland field monitoring kit | 967 | Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only. | Each | $50.67 | 1 | $50.67 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 10 | $322.20 |

**Practice:** E646A - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

**Scenario** #1 - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

**Scenario Description:**

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds . In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $1,669.09

**Scenario Cost/Unit:** $33.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 9 | $222.30 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 2.5 | $76.55 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 22 | $708.84 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |

**Practice:** E646B - Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat

**Scenario** #1 - Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat

**Scenario Description:**

When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. Benefits may become greatest during late winter and early spring as birds are assimilating nutrient and fat reserves in preparation for northward migration. However, agricultural fields flooded during fall-winter are typically drained during late January or February in advance of spring planting. This often results in a rapid reduction in available habitat, and may constrain ability of migratory birds to adequately prepare for migration, with greatest impacts likely occurring during years of low winter precipitation. Retention of water on agricultural lands into early spring will produce maximum benefits to migratory waterfowl and shorebirds by providing high quality habitat during a time when habitat may otherwise be in low abundance.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $1,979.65

**Scenario Cost/Unit:** $39.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 11 | $271.70 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 2.5 | $76.55 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |

**Practice:** E646C - Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

**Scenario** #1 - Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

**Scenario Description:**

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding and providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $3,075.11

**Scenario Cost/Unit:** $61.50

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 9 | $222.30 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 4.5 | $137.79 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 50 | $1,006.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 22 | $708.84 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 5 | $661.40 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** E646D - Manipulate vegetation and maintain closed structures for shorebird late summer habitat

**Scenario** #1 - Manipulate vegetation and maintain closed structures for shorebird late summer habitat

**Scenario Description:**

Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

**Feature Measure:** acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $3,416.29

**Scenario Cost/Unit:** $68.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 11 | $271.70 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 5.5 | $168.41 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acres | $20.13 | 50 | $1,006.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 26 | $837.72 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 6 | $793.68 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** E647A - Manipulate vegetation on fields with captured rainfall for waterfowl & wading bird winter habitat

**Scenario** #1 - Manipulate vegetation on fields with captured rainfall for waterfowl & wading bird winter habitat

**Scenario Description:**

Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. Seed densities in harvested rice fields may rival those documented in intensively managed moist-soil units, especially in the Gulf Coast and Central Valley of California. When flooded to shallow depths during fall and winter, these agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. In many cases, light manipulation of dense vegetation is needed to improve the accessibility of food resources to waterfowl, wading birds, and shorebirds.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $1,281.74

**Scenario Cost/Unit:** $25.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 8 | $506.64 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** E647B - Provide early successional shorebird habitat between first crop and ratoon crop

**Scenario** #1 - Provide early successional shorebird habitat between first crop and ratoon crop

**Scenario Description:**

Many declining suites of wildlife species rely on early successional habitats for at least part of their life cycle needs. Migratory shorebird species in particular rely on open, moist soil or shallowly flooded conditions for foraging and security. Rice farms support many migratory and resident water bird species. The first rice crop harvest often coincides with the arrival of early migrating shorebirds. This time of year is also the highest rainfall months. If standing rice stubble from the first crop is rolled to push above-ground stalks level with the soil surface, the first component of this type of habitat is met. When moisture is added to this situation, short-term habitat is available until the ratoon crop initiates growth to a height beyond that which would provide benefit to the early successional species.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $1,281.74

**Scenario Cost/Unit:** $25.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hours | $63.33 | 8 | $506.64 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $251.47 | 2 | $502.94 |

**Practice:** E647C - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

**Scenario** #1 - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

**Scenario Description:**

The wetter or more water saturated portions of cropland fields such as areas adjacent to field drains, have the potential to produce a significant amount of moist soil plants which are a tremendously valuable source of forage and cover for many waterfowl, shorebird and wading bird species, especially during a period of time when such plants may be limited. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. These maintained moist soil plants also will provide filtering and improve water quality.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $532.20

**Scenario Cost/Unit:** $10.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 3 | $91.86 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** E647D - Establish and maintain early successional habitat in ditches and bank borders

**Scenario** #1 - Establish and maintain early successional habitat in ditches and bank borders

**Scenario Description:**

This enhancement is to encourage the establishment of early successional, naturally occurring vegetation in ditches, side slope and bank borders to provide cover, critical nesting and brood rearing habitat as well as filtering overland flow and improving water quality. Ditches perform the critical function of removing water from agricultural lands. Allowing naturally occurring vegetation to develop along ditches, including side slopes, banks and borders, will help provide food and cover for wildlife while enhancing aquatic habitat and improving water quality. Ditches and ditch borders provide a foundation that supports a diverse wildlife community including Northern Bobwhite (Colinus virginianus) and other birds preferring early successional cover. Rabbits, furbearers, amphibians and many other species that inhabit agriculture areas will use this vegetative cover. These areas can also provide critical nesting habitat for the Mottled Duck (Anas fulvigula).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $532.20

**Scenario Cost/Unit:** $10.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hours | $30.62 | 3 | $91.86 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 3 | $102.06 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 2 | $338.28 |

**Practice:** E666A - Maintaining and improving forest soil quality

**Scenario** #1 - Maintaining and improving forest soil quality

**Scenario Description:**

Adopts guidelines for maintaining and improving soil quality on sites where forest management activities are practiced. These guidelines will increase soil organic matter content, improve nutrient cycling, and increase infiltration and retention of precipitation. Avoiding soil compaction will allow for greater root development and tree growth, limit windthrow, and reduce drought stress. Increasing carbon storage on site will maintain the soil microbial community and provide wildlife benefits.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 50.00

**Scenario Total Cost:** $2,531.22

**Scenario Cost/Unit:** $50.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 4 | $26.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 4 | $74.20 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 13 | $1,719.64 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $15.50 | 10 | $155.00 |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 5 | $52.15 |
| Certified Organic, Annual Grasses, Legumes and/or Forbs | 2343 | Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only. | Acres | $65.49 | 3 | $196.47 |

**Practice:** E666D - Forest management to enhance understory vegetation

**Scenario** #1 - Forest management to enhance understory vegetation

**Scenario Description:**

This enhancement provides for management of the understory vegetation in a forested area by mechanical, chemical, and/or manual methods to improve the plant species mix and the health of the residual vegetation. Managing the understory vegetation increases available water to the plants, minimizes runoff and erosion, and improves water quality. An adequately stocked forest provides inputs of leaves, needles, and woody twigs and stems to the forest floor, adding to soil organic matter and contributing to forest soil health. Desirable tree species and understory vegetation, with spacing that allows ground cover to develop, will allow moisture to infiltrate and be stored in the soil, releasing moisture over longer periods of time.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $5,954.06

**Scenario Cost/Unit:** $297.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 16 | $1,715.36 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 16 | $1,052.96 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 11 | $1,455.08 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 20 | $1,017.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E666E - Reduce height of the forest understory to limit wildfire risk

**Scenario** #1 - Reduce height of the forest understory to limit wildfire risk

**Scenario Description:**

Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy. This enhancement provides for management of the understory vegetation in a forested area, using mechanical, chemical or manual methods to improve the plant species mix and the health of the residual vegetation, and reduce the risk of wildfire. In appropriate stands, the treatment creates conditions that favor prescribed burning. Forest stand improvement (FSI) activities are used to remove trees of undesirable species, form, quality, condition, or growth rate. The quantity and quality of forest for wildlife and/or timber production will be increased by manipulating stand density and structure. These treatments can also reduce wildfire hazards, improve forest health, restore natural plant communities, and achieve or maintain a desired native understory plant community for soil health, wildlife, grazing, and/or browsing.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $5,954.06

**Scenario Cost/Unit:** $297.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 16 | $1,715.36 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 16 | $1,052.96 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 16 | $544.32 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 11 | $1,455.08 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 20 | $1,017.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E666F - Reduce forest stand density to create open stand structure

**Scenario** #1 - Reduce forest stand density to create open stand structure

**Scenario Description:**

Reducing forest stand density creates open forest conditions with a low basal area which promotes the health and vigor of the residual trees. The open stand structure allows a significant amount of sunlight to reach the forest floor and stimulates the growth of understory vegetation. Understory vegetation management, along with the wide spacing between trees or clumps of trees, provides visual appeal, lowers the risk of wildfire, and provides habitat for many at-risk and listed wildlife species. The enhancement creates conditions that facilitate a follow-up treatment with prescribed burning.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 20.00

**Scenario Total Cost:** $6,782.22

**Scenario Cost/Unit:** $339.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 20 | $2,144.20 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 20 | $1,316.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 20 | $680.40 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 11 | $1,455.08 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 20 | $1,017.20 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E666G - Reduce forest density and manage understory along roads to limit wildfire risk and improve habitat

**Scenario** #1 - Reduce forest density and manage understory along roads to limit wildfire risk and improve habitat

**Scenario Description:**

Opening the tree canopy along roads ("daylighting"), and providing space between ground vegetation and tree crowns minimizes the spread of wildfires that often start along roads, and improves wildlife habitat and food sources for many species. Some trees near a forest road are removed through harvesting, cutting, mulching, or another option available at the site, with the objective of creating a partially open forest canopy bordering the road. A semi-open canopy allows more sunlight to reach the forest floor to promote herbaceous understory plants, and reduces maintenance needs by allowing moisture to evaporate from roads. The reduced canopy and herbaceous understory limit woodland fuel buildup and reduce fire intensity.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $3,534.12

**Scenario Cost/Unit:** $353.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 8 | $53.20 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hours | $107.21 | 8 | $857.68 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 8 | $526.48 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 8 | $257.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hours | $34.02 | 8 | $272.16 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Herbicide, Imazapyr | 336 | Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $50.86 | 10 | $508.60 |

**Practice:** E666H - Increase on-site carbon storage

**Scenario** #1 - Increase on-site carbon storage

**Scenario Description:**

Use forest management techniques to maintain and increase on-site carbon storage. These include, but are not limited to, applying uneven-aged management, using longer rotations, retaining cavity/den trees, snags, and down woody debris, and protecting or increasing soil organic material.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 100.00

**Scenario Total Cost:** $1,719.64

**Scenario Cost/Unit:** $17.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Labor** | | | | | | |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 13 | $1,719.64 |

**Practice:** E666I - Crop tree management for mast production

**Scenario** #1 - Crop tree management for mast production

**Scenario Description:**
Forest stand improvement using crop tree management techniques to increase mast production

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $4,158.74

**Scenario Cost/Unit:** $415.87

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 25 | $166.25 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 25 | $1,645.25 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 25 | $805.50 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $23.10 | 10 | $231.00 |

**Practice:** E666J - Facilitating oak forest regeneration

**Scenario** #1 - Facilitating oak forest regeneration

**Scenario Description:**

Facilitate oak regeneration following a forest stand improvement treatment for natural oak regeneration (i.e., a regeneration cut). After a regeneration cut, oaks in the seedling and sapling stages are often out-competed by invasive brush and undesirable tree and shrub species. This enhancement will release seedling and sapling oaks from competing invasive plants and other undesirable species, and thin stump sprouts. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in oak regeneration by providing for follow-up activities that require the expertise of a professional forester.

**Before Situation:**

Naturally regenerated oak seedlings and/or saplings are threatened by competition from undesirable vegetation.

**After Situation:**

Oaks in the forest stand are free from competition and have adequate space and light to allow them to grow into the forest canopy.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $16,398.95

**Scenario Cost/Unit:** $655.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 6 | $39.90 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 16 | $395.20 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 10 | $658.10 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 6 | $306.96 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 56 | $1,804.32 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 34 | $4,497.52 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 5 | $52.15 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 5 | $196.10 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 5 | $11.20 |
| Tree shelter, solid tube type, 4 in. x 48 in. | 1566 | 4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only. | Each | $4.60 | 1250 | $5,750.00 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only. | Each | $0.07 | 2500 | $175.00 |
| Stakes, wood, 3/4 in. x 3/4 in. x 48 in. | 1582 | 3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only. | Each | $2.01 | 1250 | $2,512.50 |

**Practice:** E666K - Creating structural diversity with patch openings

**Scenario** #1 - Creating structural diversity with patch openings

**Scenario Description:**

Forest stand improvement that creates patch openings. Size, shape, and arrangement of patches will be based on natural features, and emulate patches that would result from natural disturbance regimes of wind or fire, varying geographically and by forest type, and by tree species desired from natural regeneration. The treatment will create diversity in stand composition and structure, increase pest resistance, and enhance wildlife food availability. Openings may provide regeneration sites and restore natural plant communities, and achieve or maintain a desired understory plant community for wildlife habitat.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 15.00

**Scenario Total Cost:** $10,169.40

**Scenario Cost/Unit:** $677.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 150 | $997.50 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 15 | $370.50 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 150 | $4,833.00 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 30 | $3,968.40 |

**Practice:** E666L - Forest Stand Improvement to rehabilitate degraded hardwood stands

**Scenario** #1 - Forest Stand Improvement to rehabilitate degraded hardwood stands

**Scenario Description:**

Hardwood forestland has been subject to poor logging practices ("high-grading") for decades. Without professional forestry assistance the best species and individual trees are removed, often before maturity ("diameter-limit cutting"), leaving the poorest species and individual trees to regenerate the stand. Reversing this process requires cutting or killing poor quality trees while retaining any desirable species that might still be present. A combination of 3 silvicultural methods are applied: crop tree release, group selection (all trees removed from an area 0.25 to 1.0 acre in size) and small clear-cuts (all trees removed from an area 1-3 acres in size).

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $5,843.10

**Scenario Cost/Unit:** $584.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 16 | $106.40 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 2 | $49.40 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 40 | $2,632.40 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hours | $18.55 | 16 | $296.80 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 16 | $515.52 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 8 | $1,058.24 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| Herbicide, Triazine | 1321 | Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $91.09 | 10 | $910.90 |
| **Mobilization** | | | | | | |
| Mobilization, small equipment | 1138 | Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds. | Each | $169.14 | 1 | $169.14 |

**Practice:** E666O - Snags, den trees, and coarse woody debris for wildlife habitat

**Scenario** #1 - Snags, den trees, and coarse woody debris for wildlife habitat

**Scenario Description:**

Improve wildlife habitat through creation and retention of snags, den trees, forest stand structural diversity, and coarse woody debris on the forest floor, to provide cover/shelter for native wildlife species.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $649.90

**Scenario Cost/Unit:** $64.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 7 | $46.55 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 1 | $24.70 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 3 | $197.43 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 7 | $358.12 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $23.10 | 1 | $23.10 |

**Practice:** E666P - Summer roosting habitat for native forest-dwelling bat species

**Scenario** #1 - Summer roosting habitat for native forest-dwelling bat species

**Scenario Description:**
Create new potential roost trees within upland and riparian forests to achieve desired summer habitat for forest-dwelling bat species.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

**Feature Measure:** Acre

**Scenario Unit:** Acres

**Scenario Typical Size:** 10.00

**Scenario Total Cost:** $2,373.46

**Scenario Cost/Unit:** $237.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 13 | $86.45 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 6 | $148.20 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 13 | $855.53 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 13 | $418.86 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 4 | $529.12 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 10 | $104.30 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $23.10 | 10 | $231.00 |

**Practice:** E666R - Forest songbird habitat maintenance

**Scenario** #1 - Forest songbird habitat maintenance

**Scenario Description:**

Adopts guidelines and methods developed by the Forest Bird Initiative of the Vermont Audubon Society, to preserve habitat features following a forest stand improvement treatment designed to create habitat for a suite of forest-dwelling neotropical migratory songbirds. It includes developing or updating a forest management plan, inspecting and tending forest habitat, and monitoring bird populations. It protects investments in habitat creation by providing for follow-up activities that require the expertise of a professional forester or biologist. This enhancement is appropriate for states in the Atlantic Flyway and the Upper Midwest.

**Before Situation:**

The bird habitat of a forest stand is threatened by undesirable vegetation, including noxious and invasive plants, and tree regeneration of species not favorable to birds. Harmful insects and tree diseases may also be present, and storms may have damaged

**After Situation:**

The forest stand has retained its habitat features and is utilized by a diversity of neotropical migratory songbirds.

**Feature Measure:** Acres

**Scenario Unit:** Acres

**Scenario Typical Size:** 25.00

**Scenario Total Cost:** $6,083.70

**Scenario Cost/Unit:** $243.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hours | $6.65 | 4 | $26.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hours | $24.70 | 10 | $247.00 |
| Chemical, spot treatment, single stem application | 964 | Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included. | Hours | $65.81 | 4 | $263.24 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hours | $51.16 | 4 | $204.64 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hours | $32.22 | 4 | $128.88 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hours | $132.28 | 38 | $5,026.64 |
| **Materials** | | | | | | |
| Tree Marking Paint | 313 | Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only. | Acres | $10.43 | 2 | $20.86 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acres | $39.22 | 4 | $156.88 |
| Herbicide, Surfactant | 1095 | Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acres | $2.24 | 4 | $8.96 |