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

**Scenario** #21 - Non-Dairy Operation Less Than 300 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small non-dairy Animal Feeding Operation (AFO) of less than 300 animal units (AU)--primarily swine, poultry, and beef AFOs. 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. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a small sized non-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 has 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. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS with the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the small-sized non-dairy 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 inventories-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. 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. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,068.46

**Scenario Cost/Unit:** $8,068.46

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 prod | Hour | $88.79 | 55 | $4,883.45 |
| 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 prod | Hour | $74.07 | 43 | $3,185.01 |

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

**Scenario** #23 - Dairy Operation Less Than 300 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) and CNMP Case File will be developed to address resource concerns on a small Dairy Animal Feeding Operation (AFO) of less than 300 animal units (AU). 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. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a small sized 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 has 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. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the small-sized dairy 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 inventories-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. 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. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $10,066.47

**Scenario Cost/Unit:** $10,066.47

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 prod | Hour | $88.79 | 75 | $6,659.25 |
| 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 prod | Hour | $74.07 | 46 | $3,407.22 |

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

**Scenario** #24 - Non-Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium non-dairy Animal Feeding Operation (AFO) of greater than or equal to 300 and less than 700 animal units (AU).--primarily swine, poultry, and beef AFOs. 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. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a medium sized non-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 has 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. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS with the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the non-dairy 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 inventories-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. 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. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $10,392.66

**Scenario Cost/Unit:** $10,392.66

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 prod | Hour | $88.79 | 72 | $6,392.88 |
| 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 prod | Hour | $74.07 | 54 | $3,999.78 |

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

**Scenario** #26 - Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium Dairy Animal Feeding Operation (AFO) of greater than or equal to 300 and less than 700 animal units (AU). 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. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a medium sized 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 has 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. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the dairy 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 inventories-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. 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. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $11,502.77

**Scenario Cost/Unit:** $11,502.77

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 prod | Hour | $88.79 | 82 | $7,280.78 |
| 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 prod | Hour | $74.07 | 57 | $4,221.99 |

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

**Scenario** #27 - Non-Dairy Operation Greater Than or Equal to 700 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a large non-dairy Animal Feeding Operation ((AFO) of greater than or equal to 700 animal units (AU)--primarily swine, poultry, and beef AFOs. 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. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a large sized non-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 has 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. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS with the CNMP Case File data that describes management and conservation practice solutions to all identified resource concerns on the non-dairy 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 inventories-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. 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. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $12,554.00

**Scenario Cost/Unit:** $12,554.00

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 prod | Hour | $88.79 | 88 | $7,813.52 |
| 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 prod | Hour | $74.07 | 64 | $4,740.48 |

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

**Scenario** #30 - Dairy Operation Greater Than or Equal to 700 AU with Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a large Dairy Animal Feeding Operation (AFO) of greater than or equal to 700 animal units (AU). 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. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of a large sized 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 has 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. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS the CNMP with Case File data that describes management and conservation practice solutions to all identified resource concerns on the dairy 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 inventories-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. 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. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Practices selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with the practice standards. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $12,790.93

**Scenario Cost/Unit:** $12,790.93

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 prod | Hour | $88.79 | 89 | $7,902.31 |
| 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 prod | Hour | $74.07 | 66 | $4,888.62 |

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

**Scenario** #31 - Livestock Operation Less Than 300 AU without Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small Animal Feeding Operation (AFO) of less than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging areas, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner’s/operator's production objectives.

**Before Situation:**

The owner/operator of a small AFO has not received a written comprehensive nutrient management plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Partial implementation of CNMP- related practices for the AFO has potentially occurred. Various levels of management and conservation implementation has 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 CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and recordkeeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS a the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable 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 inventories/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. 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; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Decisions selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with those in the conservation practice. Accurate recordkeeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist..

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,267.47

**Scenario Cost/Unit:** $7,267.47

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 prod | Hour | $88.79 | 66 | $5,860.14 |
| 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 prod | Hour | $74.07 | 19 | $1,407.33 |

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

**Scenario** #33 - Livestock Operation Greater Than 300 AU without Land Application

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium-large Animal Feeding Operation (AFO) of greater than or equal to 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner’s/operator's production objectives.

**Before Situation:**

The owner/operator of a medium-large sized AFO has not received a written comprehensive nutrient management plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Various levels of management and conservation implementation has 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 CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and recordkeeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS a the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable 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 inventories/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria by a Professional Engineer. 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; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Decisions selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with those in the conservation practice. Accurate recordkeeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $9,028.55

**Scenario Cost/Unit:** $9,028.55

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 prod | Hour | $88.79 | 85 | $7,547.15 |
| 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 prod | Hour | $74.07 | 20 | $1,481.40 |

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

**Scenario** #135 - CNMP Less Than or Equal to 300 AU with Land Application (Minimal Engineer Assistance)

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small non-dairy Animal Feeding Operation (AFO) of less than 300 animal units (AU)--primarily swine, poultry, and beef AFOs. This scenario is for sites or states where the services of a professional engineer are minimal. The producer may export modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan includes all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas result in meeting NRCS planning criteria for water quality, soil erosion, and air quality concerns. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of an 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 has occurred on the farm. Little documentation of the systems used and practices installed exists. Partial implementation of conservation practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS with the CNMP Case File data that describes management and conservation practice systems to address 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 inventories-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. 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 address soil erosion, water quality, and air quality within the NRCS planning criteria. Accurate record keeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

**Feature Measure:** Each

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,679.90

**Scenario Cost/Unit:** $4,679.90

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, physi | Hour | $75.84 | 50 | $3,792.00 |
| 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 prod | Hour | $88.79 | 10 | $887.90 |

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

**Scenario** #136 - CNMP Less Than or Equal to 300 AU without Land Application (Minimal Engineer Assistance)

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on the Animal Feeding Operation (AFO) of less than 300 or equal animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer exports nearly all of the manure or organic products from the farm. The CNMP is a conservation plan that addresses soil erosion, water quality, and air quality resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing soil erosion, water quality, and air quality resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging areas, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner's/operator's production objectives.

**Before Situation:**

The owner/operator of the AFO has not received a written comprehensive nutrient management plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Various levels of management and conservation implementation has 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 CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and record keeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and record keeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS a the CNMP Case File that describes management and conservation practice practices to address all identified soil erosion, water quality, and air quality resource concerns on the AFO production area and any applicable 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 inventories/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. 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; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Decisions selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with those in the conservation practice. Accurate record keeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

**Feature Measure:** Each

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,739.65

**Scenario Cost/Unit:** $2,739.65

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 prod | Hour | $88.79 | 10 | $887.90 |
| 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 prod | Hour | $74.07 | 25 | $1,851.75 |

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

**Scenario** #137 - CNMP Greater Than 300 AU with Land Application (Minimal Engineer Assistance)

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on an Animal Feeding Operation (AFO) of greater than or equal to 300 animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer may export modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most manure nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

**Before Situation:**

The owner/operator of an 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 has occurred on the farm. Little documentation of the systems used and practices installed exists. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and record keeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive nutrient management plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS with the CNMP Case File data that describes management and conservation practices to address all identified soil erosion, water quality, and air quality 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 inventories-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. 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. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts. Practices selected in the Record of Decision will provide estimated quantities for conservation practices to be installed in units of measure that align with the practice standards. Accurate record keeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

**Feature Measure:** Each

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,146.40

**Scenario Cost/Unit:** $6,146.40

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 prod | Hour | $88.79 | 15 | $1,331.85 |
| 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 prod | Hour | $74.07 | 65 | $4,814.55 |

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

**Scenario** #138 - CNMP Greater Than 300 AU without Land Application (Minimal Engineer Assistance)

**Scenario Description:**

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on an Animal Feeding Operation (AFO) of greater than 300 animal units (AU). This scenario is for sites or states where the services of a professional engineer are minimal. The producer exports nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses the soil erosion, water quality, and air quality resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS planning criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owners/operator's production objectives.

**Before Situation:**

The owner/operator of an AFO has not received a written comprehensive nutrient management plan (CNMP) that addresses the soil erosion, water quality, and air quality resource concerns present on the facility production areas and any applicable land application areas. Various levels of management and conservation implementation has 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 CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, soil erosion, water quality, and air quality concerns from feeding and lounging areas, and record keeping documentation of manure generation and exports. Negative air quality impacts issues may remain on the AFO, and record keeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

**After Situation:**

A certified Technical Services Provider (TSP) has delivered to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (GM - Part 405 - Comprehensive Nutrient Management Plans) and to NRCS a the CNMP Case File that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems are inventoried/evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. 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; minimize soil erosion, water quality, and air quality concerns from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts. Decisions selected in the Record of Decisions will provide estimated quantities for conservation practices to be installed in units of measure that align with those in the conservation practice. Accurate record keeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP.

**Feature Measure:** Each

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,110.00

**Scenario Cost/Unit:** $3,110.00

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 prod | Hour | $88.79 | 10 | $887.90 |
| 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 prod | Hour | $74.07 | 30 | $2,222.10 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario** #14 - Nutrient Management CAP Less Than or Equal to 100 Acres (Not part of a CNMP)

**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 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, profits margin, 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 develop of the "Nutrient Management" conservation activity plan consistent with the criteria in CAP 104 and 590 Nutrient Management. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,275.20

**Scenario Cost/Unit:** $2,275.20

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, physi | Hour | $75.84 | 30 | $2,275.20 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario** #15 - Nutrient Management CAP 104- 101-300 Acres (Not part of a CNMP)

**Scenario Description:**

Various on-farm land uses where organic or inorganic 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 applicant and management of land applied nutrients. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, nutrient use efficiency 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 develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet Nutrient Management criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,033.60

**Scenario Cost/Unit:** $3,033.60

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, physi | Hour | $75.84 | 40 | $3,033.60 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario** #16 - Nutrient Management CAP 104 Greater Than 300 Acres (Not part of a CNMP)

**Scenario Description:**

Various on-farm land uses where organic or inorganic 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 applicant and management of land applied nutrients. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, nutrient use efficiency, 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. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,792.00

**Scenario Cost/Unit:** $3,792.00

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, physi | Hour | $75.84 | 50 | $3,792.00 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario** #17 - Nutrient Management CAP 104 Less Than or Equal to 100 Acres (Element of a CNMP)

**Scenario Description:**

Various on-farm land uses where natural or artificial nutrient 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 applicant and management of nutrient applied to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, 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 develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet nutrient criteria for the primary Water Quality resource concern in 590 and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,792.00

**Scenario Cost/Unit:** $3,792.00

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, physi | Hour | $75.84 | 50 | $3,792.00 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario** #18 - Nutrient Management CAP 104 - 101-300 Acres (Element of a CNMP)

**Scenario Description:**

Various on-farm land uses where organic or inorganic 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 applicant and management of applied nutrients to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, 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 develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet 590 criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,308.80

**Scenario Cost/Unit:** $5,308.80

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, physi | Hour | $75.84 | 70 | $5,308.80 |

**Practice:** 104 - Nutrient Management Plan - Written

**Scenario** #19 - Nutrient Management CAP 104 Greater Than 300 Acres (Element of a CNMP)

**Scenario Description:**

Various on-farm land uses where organic or inorganic 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 applicant and management of nutrient s applied to the land. The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, 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 develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet 590 criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,446.40

**Scenario Cost/Unit:** $6,446.40

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, physi | Hour | $75.84 | 85 | $6,446.40 |

**Practice:** 106 - Forest Management Plan - Written

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

**Scenario Description:**

Non Industrial 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 concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, 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, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

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

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,365.91

**Scenario Cost/Unit:** $1,365.91

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 t | Hour | $71.89 | 19 | $1,365.91 |

**Practice:** 106 - Forest Management Plan - Written

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

**Scenario Description:**

Non Industrial 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 concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, 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, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

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

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,725.36

**Scenario Cost/Unit:** $1,725.36

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 t | Hour | $71.89 | 24 | $1,725.36 |

**Practice:** 106 - Forest Management Plan - Written

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

**Scenario Description:**

Non Industrial 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 concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, 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, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

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

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,091.27

**Scenario Cost/Unit:** $3,091.27

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 t | Hour | $71.89 | 43 | $3,091.27 |

**Practice:** 106 - Forest Management Plan - Written

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

**Scenario Description:**

Non Industrial 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 concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, 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, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

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

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,470.10

**Scenario Cost/Unit:** $6,470.10

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 t | Hour | $71.89 | 90 | $6,470.10 |

**Practice:** 106 - Forest Management Plan - Written

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

**Scenario Description:**

Non Industrial 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 concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, 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, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

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

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,457.18

**Scenario Cost/Unit:** $4,457.18

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 t | Hour | $71.89 | 62 | $4,457.18 |

**Practice:** 106 - Forest Management Plan - Written

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

**Scenario Description:**

Non Industrial 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 concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, 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, 391, 791, 490, 612, 660, 311, 380.

**After Situation:**

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

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,176.08

**Scenario Cost/Unit:** $5,176.08

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 t | Hour | $71.89 | 72 | $5,176.08 |

**Practice:** 108 - Feed Management Plan - Written

**Scenario** #22 - Feed Management Plan

**Scenario Description:**

The owner/operator of an Animal Feeding Operation (AFO) has not received a written Feed Management Plan (FeedMP) 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 FeedMP 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 recordkeeping nutrient, inspection and monitoring of the existing operation may need further improvement.

**Before Situation:**

Producer has no plan or 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:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the “Feed Management” (FM) conservation activity plan (CAP). The CAP 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 CAP plan may serve as the basis for implementation of the primary conservation practice 592-Feed Management. If applicable, the FM CAP may also be developed to complement Comprehensive Nutrient Management Plans (CNMP) or to help meet requirements of NRCS practice standard 590 - Nutrient Management. As addressed in the CAP planning criteria, the plan may include recommendations for addressing associated natural resource concerns with other conservation practices. The FM CAP meets the basic quality criteria for the 108 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,402.72

**Scenario Cost/Unit:** $2,402.72

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, physi | Hour | $75.84 | 16 | $1,213.44 |
| 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 an | Hour | $74.33 | 16 | $1,189.28 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario** #1 - Grazing Management Plan Less Than or Equal to 100 acres

**Scenario Description:**

Small agricultural operation with less than 100 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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,229.90

**Scenario Cost/Unit:** $2,229.90

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 an | Hour | $74.33 | 30 | $2,229.90 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario** #2 - Grazing Management Plan 101 to 500 acres

**Scenario Description:**

Small 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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,973.20

**Scenario Cost/Unit:** $2,973.20

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 an | Hour | $74.33 | 40 | $2,973.20 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario** #3 - Grazing Management Plan 1501 to 5000 acres

**Scenario Description:**

Small agricultural operation with 1501 to 5000 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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,459.80

**Scenario Cost/Unit:** $4,459.80

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 an | Hour | $74.33 | 60 | $4,459.80 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario** #5 - Grazing Management Plan Greater Than 5000 acres

**Scenario Description:**

Small agricultural operation with more than 5000 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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,203.10

**Scenario Cost/Unit:** $5,203.10

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 an | Hour | $74.33 | 70 | $5,203.10 |

**Practice:** 110 - Grazing Management Plan - Written

**Scenario** #66 - Grazing Management Plan 501 to 1500 acres

**Scenario Description:**

Small agricultural operation with 501 to 1500 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 plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margin, 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 collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechanical Treatment, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number of plans

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,716.50

**Scenario Cost/Unit:** $3,716.50

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 an | Hour | $74.33 | 50 | $3,716.50 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario** #7 - Prescribed Burning Plan 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. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e. – streams, lakes, etc.) and man-made firebreaks (i.e. – roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan 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” Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP 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 CAP 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 CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $359.45

**Scenario Cost/Unit:** $359.45

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 t | Hour | $71.89 | 5 | $359.45 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario** #33 - Prescribed Burning Plan 21-100 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically 21 to 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. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e. – streams, lakes, etc.) and man-made firebreaks (i.e. – roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan 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” Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP 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 CAP 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 CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $575.12

**Scenario Cost/Unit:** $575.12

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 t | Hour | $71.89 | 8 | $575.12 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario** #34 - Prescribed Burning Plan 101-250 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically 101 to 250 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. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e. – streams, lakes, etc.) and man-made firebreaks (i.e. – roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan 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” Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP 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 CAP 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 CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $862.68

**Scenario Cost/Unit:** $862.68

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 t | Hour | $71.89 | 12 | $862.68 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario** #35 - Prescribed Burning Plan 251-500 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically 251 to 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. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e. – streams, lakes, etc.) and man-made firebreaks (i.e. – roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan 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” Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP 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 CAP 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 CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,150.24

**Scenario Cost/Unit:** $1,150.24

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 t | Hour | $71.89 | 16 | $1,150.24 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario** #36 - Prescribed Burning Plan 501-1000 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically 501 to 1000 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. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e. – streams, lakes, etc.) and man-made firebreaks (i.e. – roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan 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” Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP 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 CAP 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 CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,437.80

**Scenario Cost/Unit:** $1,437.80

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 t | Hour | $71.89 | 20 | $1,437.80 |

**Practice:** 112 - Prescribed Burning Plan - Written

**Scenario** #37 - Prescribed Burning Plan Greater Than 1000 Acres

**Scenario Description:**

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 1000 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. Due to the size, landscape position, low to moderate fuel loads and presence of both natural firebreaks (i.e. – streams, lakes, etc.) and man-made firebreaks (i.e. – roads, farm paths, agricultural fields, etc.), few newly constructed firebreaks are needed to implement the prescribed burn. A Prescribed Burning Plan or Conservation Activity Plan 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” Conservation Activity Plan (CAP). The CAP criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan CAP 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 CAP 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 CAP plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,725.36

**Scenario Cost/Unit:** $1,725.36

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 t | Hour | $71.89 | 24 | $1,725.36 |

**Practice:** 114 - Integrated Pest Management Plan - Written

**Scenario** #8 - IPM Management CAP Small-Specialty Less Than 50 Acres

**Scenario Description:**

Various on-farm land uses where pests are managed on smaller operations, including organic and specialty crop operations where more complicated pest management evaluations and solutions may be necessary. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

**Before Situation:**

Agricultural currently producer has no plan or limited knowledge of development or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in management of pests and reduce the environmental impacts for environmental benefit. 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Integrated Pest Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of "Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,896.00

**Scenario Cost/Unit:** $1,896.00

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, physi | Hour | $75.84 | 25 | $1,896.00 |

**Practice:** 114 - Integrated Pest Management Plan - Written

**Scenario** #9 - IPM Management CAP Medium 51 - 250 Acres

**Scenario Description:**

Various on-farm land uses where pests are managed on a moderately-sized farm where IPM is to be applied. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

**Before Situation:**

Agricultural currently producer has no plan or limited knowledge of development or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in management of pests and reduce the environmental impacts for environmental benefit. 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Integrated Pest Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of "Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,426.88

**Scenario Cost/Unit:** $2,426.88

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, physi | Hour | $75.84 | 32 | $2,426.88 |

**Practice:** 114 - Integrated Pest Management Plan - Written

**Scenario** #10 - IPM Management CAP Large - Greater Than 250 Acres

**Scenario Description:**

Various on-farm land uses where pests are managed on a larger farm where IPM strategies are to be applied. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

**Before Situation:**

Agricultural currently producer has no plan or limited knowledge of development or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in management of pests and reduce the environmental impacts for environmental benefit. 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Integrated Pest Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of "Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,792.00

**Scenario Cost/Unit:** $3,792.00

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, physi | Hour | $75.84 | 50 | $3,792.00 |

**Practice:** 118 - Irrigation Water Management Plan - Written

**Scenario** #4 - Irrigation Water Management Conservation Activity Plan CAP

**Scenario Description:**

Agricultural operations supported with existing irrigation systems. Natural Resource Concern: Water quantity and all other appropriate resource concerns.

**Before Situation:**

Currently producer has no plan or limited knowledge for management of water application to meet crop needs and address identified resource concerns. The producer currently manages water application based upon personal knowledge, or other local criteria. Producer is interested in management of irrigation water to maximize yields, profit margin, reduce costs, and for environmental benefit. 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: Irrigation Water Management (449); Irrigation System (442); Irrigation System, Surface & Subsurface (443); Irrigation Pipeline (430); Irrigation Ditch Lining (428); Irrigation Field Ditch (388); Irrigation Canal or Lateral (320); Structure for Water Control (587); Irrigation Reservoir (436); Irrigation System, Tailwater Recovery (447); Pumping Plant (533); Irrigation Land Leveling (464); Anionic Polyacrylamide (PM) Application (450); Salinity and Sodic Soil Management (590); Nutrient Management (590); Waste Utilization (633); or other applicable conservation practices in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Irrigation Water Management" conservation activity plan to control the volume, frequency, and rate of water for efficient irrigation and to address other resource concerns. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 118 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,107.65

**Scenario Cost/Unit:** $3,107.65

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 prod | Hour | $88.79 | 35 | $3,107.65 |

**Practice:** 118 - Irrigation Water Management Plan - Written

**Scenario** #17 - Irrigation Water Management CAP with pump test

**Scenario Description:**

Agricultural operations supported with existing irrigation systems. Natural Resource Concern: Water quantity and all other appropriate resource concerns.

**Before Situation:**

Currently producer has no plan or limited knowledge for management of water application to meet crop needs and address identified resource concerns. The producer currently manages water application based upon personal knowledge, or other local criteria. The pump for the irrigation system is of unknown performance. Producer is interested in management of irrigation water to maximize yields, profit margin, reduce costs, and for environmental benefit. 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: Irrigation Water Management (449); Irrigation System (442); Irrigation System, Surface & Subsurface (443); Irrigation Pipeline (430); Irrigation Ditch Lining (428); Irrigation Field Ditch (388); Irrigation Canal or Lateral (320); Structure for Water Control (587); Irrigation Reservoir (436); Irrigation System, Tailwater Recovery (447); Pumping Plant (533); Irrigation Land Leveling (464); Anionic Polyacrylamide (PM) Application (450); Salinity and Sodic Soil Management (590); Nutrient Management (590); Waste Utilization (633); or other applicable conservation practices in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Irrigation Water Management" conservation activity plan to control the volume, frequency, and rate of water for efficient irrigation and to address other resource concerns. Because a pump test was performed, a new pump that operates more efficiently and matches the irrigation system has been analyzed and could possibly be installed such that less water and energy are consumed. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 118 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Acre

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,883.45

**Scenario Cost/Unit:** $4,883.45

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 prod | Hour | $88.79 | 55 | $4,883.45 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #89 - AgEMP Small, One Enterprise

**Scenario Description:**

Typical operation has either < 300 Acres < 300 AU Up to 2 irrigation pumps <20,000 sq ft of heater greenhouse, or A maple syrup enterprise One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard. A small operation is as described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource: Energy Conservation

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a small operation as described above. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,034.95

**Scenario Cost/Unit:** $2,034.95

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 prod | Hour | $88.79 | 9 | $799.11 |
| 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. | Hour | $39.94 | 17 | $678.98 |
| 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. | Hour | $27.32 | 1.5 | $40.98 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 12 | $515.88 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #90 - AgEMP Medium, One Enterprise

**Scenario Description:**

Typical operation has either 301 to 2500 Ac 301 to 1000 AU 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq ft heated greenhouse One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard. A medium operation as described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource: Energy Conservation

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a medium small operation with enterprise described above. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,526.88

**Scenario Cost/Unit:** $2,526.88

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 prod | Hour | $88.79 | 12 | $1,065.48 |
| 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. | Hour | $39.94 | 18 | $718.92 |
| 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. | Hour | $27.32 | 2 | $54.64 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 16 | $687.84 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #91 - AgEMP Large, One Enterprise

**Scenario Description:**

Typical operation has either > 2,500 Ac > 1000 AU More than 7 irrigation pumps or > 40,001 sq ft of heater greenhouse One enterprise as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation with one enterprise, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource: Energy Conservation.

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a large operation with enterprise described above. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,327.93

**Scenario Cost/Unit:** $3,327.93

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 prod | Hour | $88.79 | 19 | $1,687.01 |
| 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. | Hour | $39.94 | 20 | $798.80 |
| 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. | Hour | $27.32 | 2.5 | $68.30 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 18 | $773.82 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #92 - AgEMP Small, Two Enterprise

**Scenario Description:**

Typical operation has either <300 Ac <300 AU Up to 2 irrigation pumps, or <20,000 sq ft heated greenhouse Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard. A small operation as described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource: Energy Conservation

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type small sized operation with two enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,141.68

**Scenario Cost/Unit:** $3,141.68

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 prod | Hour | $88.79 | 15 | $1,331.85 |
| 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. | Hour | $39.94 | 21 | $838.74 |
| 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. | Hour | $27.32 | 2.5 | $68.30 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 21 | $902.79 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #93 - AgEMP Medium Two Enterprises

**Scenario Description:**

Typical operation has either 301 to 2500 Ac 301 to 1000 AU 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq ft heated greenhouse Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource: Energy Conservation

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any operation with two enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,248.41

**Scenario Cost/Unit:** $4,248.41

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 prod | Hour | $88.79 | 21 | $1,864.59 |
| 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. | Hour | $39.94 | 25 | $998.50 |
| 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. | Hour | $27.32 | 3.5 | $95.62 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 30 | $1,289.70 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #94 - AgEMP Large, Two Enterprises

**Scenario Description:**

Typical operation has either > 2,500 Ac > 1000 AU More than 7 irrigation pumps or > 40,001 sq ft of heater greenhouse Two enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation, one of which is described above . Multiple irrigation systems or a mixture of irrigation types may be counted as one of extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource: Energy Conservation

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any operation with two enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,799.09

**Scenario Cost/Unit:** $5,799.09

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 prod | Hour | $88.79 | 32 | $2,841.28 |
| 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. | Hour | $39.94 | 29 | $1,158.26 |
| 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. | Hour | $27.32 | 4.5 | $122.94 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 39 | $1,676.61 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #95 - AgEMP Small, Three Enterprise

**Scenario Description:**

Typical operation has either < 300 Acres < 300 AU Up to 2 irrigation pumps <20,000 sq ft of heater greenhouse, or Three enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a small operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type of operation with three enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 122 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,633.61

**Scenario Cost/Unit:** $3,633.61

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 prod | Hour | $88.79 | 18 | $1,598.22 |
| 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. | Hour | $39.94 | 22 | $878.68 |
| 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. | Hour | $27.32 | 3 | $81.96 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 25 | $1,074.75 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #96 - AgEMP Medium, Three Enterprise

**Scenario Description:**

Typical operation has either 301 to 2500 Ac 301 to 1000 AU 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq ft heated greenhouse Three enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type of operation with three enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,740.34

**Scenario Cost/Unit:** $4,740.34

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 prod | Hour | $88.79 | 24 | $2,130.96 |
| 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. | Hour | $39.94 | 26 | $1,038.44 |
| 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. | Hour | $27.32 | 4 | $109.28 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 34 | $1,461.66 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #97 - AgEMP Large, Three Enterprise

**Scenario Description:**

Typical operation has either > 2,500 Ac > 1000 AU More than 7 irrigation pumps or > 40,001 sq ft of heater greenhouse Three enterprise as defined in the ASABE S612 Standard on-farm energy audit standard in combination with a large operation, one of which is described above. Multiple irrigation systems or a mixture of irrigation types may be counted as one of extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type operation with three enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,379.81

**Scenario Cost/Unit:** $6,379.81

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 prod | Hour | $88.79 | 36 | $3,196.44 |
| 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. | Hour | $39.94 | 30 | $1,198.20 |
| 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. | Hour | $27.32 | 5 | $136.60 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 43 | $1,848.57 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #98 - AgEMP Small, Four Enterprises

**Scenario Description:**

Typical operation has either < 300 Acres < 300 AU Up to 2 irrigation pumps, or <20,000 sq ft of heater greenhouse Four enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with an small operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any operation with four enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,434.66

**Scenario Cost/Unit:** $4,434.66

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 prod | Hour | $88.79 | 25 | $2,219.75 |
| 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. | Hour | $39.94 | 24 | $958.56 |
| 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. | Hour | $27.32 | 3.5 | $95.62 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 27 | $1,160.73 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #99 - AgEMP 128 Medium, Four Enterprise

**Scenario Description:**

Typical operation has either 301 to 2500 Ac 301 to 1000 AU 3 to 6 Irrigation Pumps, or 20,001 to 40,000 sq ft heated greenhouse Four enterprise as defined in the ASABE S612 Standard on-farm energy audit standard in combination with an medium operation, one of which is described above. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type of operation with four or more enterprises will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 122 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,541.39

**Scenario Cost/Unit:** $5,541.39

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 prod | Hour | $88.79 | 31 | $2,752.49 |
| 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. | Hour | $39.94 | 28 | $1,118.32 |
| 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. | Hour | $27.32 | 4.5 | $122.94 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 36 | $1,547.64 |

**Practice:** 128 - Agricultural Energy Management Plan - Written

**Scenario** #100 - AgEMP 128 Large, Four Enterprise

**Scenario Description:**

Typical operation has either > 2,500 Ac > 1000 AU More than 7 irrigation pumps or > 40,001 sq ft of heater greenhouse Four enterprises as defined in the ASABE S612 Standard on-farm energy audit standard in combination with an large livestock operation, one of which is described above. . Multiple irrigation systems or a mixture of irrigation types may be counted as one of extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Natural Resource Concern: Energy Conservation.

**Before Situation:**

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 Standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $7,269.65

**Scenario Cost/Unit:** $7,269.65

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 prod | Hour | $88.79 | 44 | $3,906.76 |
| 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. | Hour | $39.94 | 32 | $1,278.08 |
| 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. | Hour | $27.32 | 5.5 | $150.26 |
| CAP Labor, Energy Auditor | 1740 | Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities. | Hour | $42.99 | 45 | $1,934.55 |

**Practice:** 130 - Drainage Water Management Plan - Written

**Scenario** #7 - DWMP - Tile Map Available

**Scenario Description:**

A Drainage Water Management Plan (DWMP) will be developed on a relatively flat crop field with a patterned drainage system, where a map of the tile system is available. The DWMP will document soil, topographic, and drainage system maps of the site, and identify the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP will also provide guidelines for management of the water control structures to achieve desired resource outcomes.

**Before Situation:**

Producer has no plan for or knowledge of managing drainage water. The producer does not manage the field for the purpose of controlling water retention during the crop season and therefore crop yields are reduced. Existing ditches and/or tile drains on the cropland field currently conduct flow off field to waterways resulting in potential water quality resource concerns related to excessive nitrogen.

**After Situation:**

A certified Technical Service Provider (TSP) develops the "Drainage Water Management" conservation activity plan (CAP). The DWMP documents soil, topographic, and drainage system maps of the site, and identifies the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP also provides guidelines for management of the water control structures to achieve desired resource outcomes. The plan is ready for implementation with structural measures and management once the structures are installed. No actual benefits to resource concerns are achieved until the practices in the DWMP are implemented.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,639.87

**Scenario Cost/Unit:** $2,639.87

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 | Hour | $104.52 | 8 | $836.16 |
| 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 prod | Hour | $74.07 | 13 | $962.91 |
| 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 | Hour | $52.55 | 16 | $840.80 |

**Practice:** 130 - Drainage Water Management Plan - Written

**Scenario** #8 - DWMP - No Tile Map Available

**Scenario Description:**

A Drainage Water Management Plan (DWMP) will be developed on a relatively flat crop field with a patterned drainage system, where no map of the tile system is available. The DWMP will document soil, topographic, and drainage system maps of the site, and identify the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP will also provide guidelines for management of the water control structures to achieve desired resource outcomes.

**Before Situation:**

Producer has no plan for or knowledge of managing drainage water. The producer does not manage the field for the purpose of controlling water retention during the crop season and therefore crop yields are reduced. Existing ditches and/or tile drains on the cropland field currently conduct flow off field to waterways resulting in potential water quality resource concerns related to excessive nitrogen.

**After Situation:**

A certified Technical Service Provider (TSP) develops the "Drainage Water Management" conservation activity plan (CAP). The DWMP documents soil, topographic, and drainage system maps of the site, and identifies the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP also provides guidelines for management of the water control structures to achieve desired resource outcomes. The plan is ready for implementation with structural measures and management once the structures are installed. No actual benefits to resource concerns are achieved until the practices in the DWMP are implemented.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,149.31

**Scenario Cost/Unit:** $3,149.31

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 | Hour | $104.52 | 8 | $836.16 |
| 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 prod | Hour | $74.07 | 13 | $962.91 |
| 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 | Hour | $52.55 | 16 | $840.80 |
| 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. | Hour | $31.84 | 16 | $509.44 |

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

**Scenario** #6 - Conservation Plan Supporting Organic Transition CAP

**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. The producer currently manages operation based upon personal knowledge, or other local criteria. Producer is interested in transitioning part or all of the management unit to meet national USDA requirements for certified operation. 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. 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. The CAP plan will include conservation practices which address related resource concerns. 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:** 1.0

**Scenario Total Cost:** $3,036.87

**Scenario Cost/Unit:** $3,036.87

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 prod | Hour | $74.07 | 41 | $3,036.87 |

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

**Scenario** #7 - Conservation Plan Supporting Organic Transition CAP No Local TSP

**Scenario Description:**

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. No qualified TSP within 300 miles. 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. The producer currently manages operation based upon personal knowledge, or other local criteria. Producer is interested in transitioning part or all of the management unit to meet national USDA requirements for certified operation. 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. 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. The CAP plan will include conservation practices which address related resource concerns. 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:** 1.0

**Scenario Total Cost:** $4,740.48

**Scenario Cost/Unit:** $4,740.48

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 prod | Hour | $74.07 | 64 | $4,740.48 |

**Practice:** 142 - Fish and Wildlife Habitat Plan - Written

**Scenario** #5 - Fish and Wildlife Habitat Management CAP

**Scenario Description:**

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation.

**Before Situation:**

Agricultural currently 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 habitat. Within existing land uses, producer is interested in management of land or for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the CAP criteria and NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Fish and Wildlife Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and other applicable resource concerns and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 142 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,225.18

**Scenario Cost/Unit:** $3,225.18

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 eff | Hour | $76.79 | 42 | $3,225.18 |

**Practice:** 146 - Pollinator Habitat Plan - Written

**Scenario** #6 - 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, producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 322, 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 develop of the "Pollinator Habitat Enhancement" conservation activity plan. 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. 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:** 1.0

**Scenario Total Cost:** $3,225.18

**Scenario Cost/Unit:** $3,225.18

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 eff | Hour | $76.79 | 42 | $3,225.18 |

**Practice:** 146 - Pollinator Habitat Plan - Written

**Scenario** #7 - 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, producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 322, 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 develop of the "Pollinator Habitat Enhancement" conservation activity plan. 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. 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:** 1.0

**Scenario Total Cost:** $4,684.19

**Scenario Cost/Unit:** $4,684.19

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 eff | Hour | $76.79 | 61 | $4,684.19 |

**Practice:** 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

**Scenario** #8 - IPM Herbicide Resistance Weed Management CAP Small-Specialty Less Than or Equal to 50 Acres

**Scenario Description:**

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

**Before Situation:**

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in management of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,275.20

**Scenario Cost/Unit:** $2,275.20

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, physi | Hour | $75.84 | 30 | $2,275.20 |

**Practice:** 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

**Scenario** #9 - IPM Herbicide Resistance Weed Management CAP Medium 51 - 250 Acres

**Scenario Description:**

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

**Before Situation:**

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in management of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,957.76

**Scenario Cost/Unit:** $2,957.76

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, physi | Hour | $75.84 | 39 | $2,957.76 |

**Practice:** 154 - IPM Herbicide Resistance Weed Conservation Plan - Written

**Scenario** #10 - IPM Herbicide Resistance Weed Management CAP Large - Greater Than 250 Acres

**Scenario Description:**

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

**Before Situation:**

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in management of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. 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: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

**After Situation:**

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendations on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

**Feature Measure:** Number

**Scenario Unit::** Number

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,550.40

**Scenario Cost/Unit:** $4,550.40

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, physi | Hour | $75.84 | 60 | $4,550.40 |

**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. 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:** 1.0

**Scenario Total Cost:** $21,773.96

**Scenario Cost/Unit:** $21,773.96

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, physi | Hour | $75.84 | 100 | $7,584.00 |
| 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 | Hour | $104.52 | 16 | $1,672.32 |
| 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 prod | Hour | $88.79 | 20 | $1,775.80 |
| 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. | Hour | $31.84 | 130 | $4,139.20 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 4 | $108.24 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 20 | $541.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $27.06 | 20 | $541.20 |
| 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 | $27.06 | 40 | $1,082.40 |

## USDA - Natural Resources Conservation Service

**New York**

**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 systems. 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:** 1.0

**Scenario Total Cost:** $15,292.24

**Scenario Cost/Unit:** $15,292.24

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, physi | Hour | $75.84 | 60 | $4,550.40 |
| 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. | Hour | $31.84 | 130 | $4,139.20 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 4 | $108.24 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 20 | $541.20 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 20 | $541.20 |
| 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 | $27.06 | 40 | $1,082.40 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #19 - Data Collect Surface Year 2+

**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 systems. 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 2 to next to 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.

**Feature Measure:** Measuring Site

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $15,292.24

**Scenario Cost/Unit:** $15,292.24

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, physi | Hour | $75.84 | 60 | $4,550.40 |
| 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. | Hour | $31.84 | 130 | $4,139.20 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 4 | $108.24 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 20 | $541.20 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 20 | $541.20 |
| 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 | $27.06 | 40 | $1,082.40 |

## USDA - Natural Resources Conservation Service

**New York**

**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. 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:** 1.0

**Scenario Total Cost:** $18,325.84

**Scenario Cost/Unit:** $18,325.84

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, physi | Hour | $75.84 | 100 | $7,584.00 |
| 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. | Hour | $31.84 | 130 | $4,139.20 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 4 | $108.24 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 40 | $1,082.40 |
| 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 | $27.06 | 20 | $541.20 |
| 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 | $27.06 | 20 | $541.20 |

**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. 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. 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:** 1.0

**Scenario Total Cost:** $43,049.32

**Scenario Cost/Unit:** $43,049.32

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, physi | Hour | $75.84 | 130 | $9,859.20 |
| 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 | Hour | $104.52 | 16 | $1,672.32 |
| 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 prod | Hour | $88.79 | 20 | $1,775.80 |
| 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. | Hour | $31.84 | 312 | $9,934.08 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 12 | $324.72 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 120 | $3,247.20 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #22 - Data Collect Tile Year 1 - 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. 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. 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 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:** 1.0

**Scenario Total Cost:** $36,567.60

**Scenario Cost/Unit:** $36,567.60

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, physi | Hour | $75.84 | 90 | $6,825.60 |
| 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. | Hour | $31.84 | 312 | $9,934.08 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 12 | $324.72 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $27.06 | 120 | $3,247.20 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #23 - Data Collect Tile Year 2+

**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. 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. 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 report, which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to 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 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. 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:** 1.0

**Scenario Total Cost:** $36,567.60

**Scenario Cost/Unit:** $36,567.60

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, physi | Hour | $75.84 | 90 | $6,825.60 |
| 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. | Hour | $31.84 | 312 | $9,934.08 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 12 | $324.72 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |

**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. 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. 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:** 1.0

**Scenario Total Cost:** $39,601.20

**Scenario Cost/Unit:** $39,601.20

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, physi | Hour | $75.84 | 130 | $9,859.20 |
| 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. | Hour | $31.84 | 312 | $9,934.08 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 12 | $324.72 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 120 | $3,247.20 |
| 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 | $27.06 | 120 | $3,247.20 |

**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. 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:** 1.0

**Scenario Total Cost:** $29,902.38

**Scenario Cost/Unit:** $29,902.38

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, physi | Hour | $75.84 | 130 | $9,859.20 |
| 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 | Hour | $104.52 | 24 | $2,508.48 |
| 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 prod | Hour | $88.79 | 30 | $2,663.70 |
| 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. | Hour | $31.84 | 156 | $4,967.04 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 6 | $162.36 |
| 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 | $27.06 | 30 | $811.80 |
| 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 | $27.06 | 30 | $811.80 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |

## USDA - Natural Resources Conservation Service

**New York**

**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. 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, 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:** 1.0

**Scenario Total Cost:** $21,696.60

**Scenario Cost/Unit:** $21,696.60

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, physi | Hour | $75.84 | 90 | $6,825.60 |
| 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. | Hour | $31.84 | 156 | $4,967.04 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 6 | $162.36 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 30 | $811.80 |
| 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 | $27.06 | 30 | $811.80 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #27 - Data Collect Surface Year 2+ 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. 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 2 to next to 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.

**Feature Measure:** Measuring site

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $21,696.60

**Scenario Cost/Unit:** $21,696.60

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, physi | Hour | $75.84 | 90 | $6,825.60 |
| 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. | Hour | $31.84 | 156 | $4,967.04 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 6 | $162.36 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 30 | $811.80 |
| 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 | $27.06 | 30 | $811.80 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |

## USDA - Natural Resources Conservation Service

**New York**

**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. 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:** 1.0

**Scenario Total Cost:** $26,247.00

**Scenario Cost/Unit:** $26,247.00

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, physi | Hour | $75.84 | 150 | $11,376.00 |
| 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. | Hour | $31.84 | 156 | $4,967.04 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 6 | $162.36 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 30 | $811.80 |
| 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 | $27.06 | 30 | $811.80 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |
| 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 | $27.06 | 60 | $1,623.60 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #29 - Data Collect Tile Year 1 with two treatment sites and 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 two treatment sites with an average of 40 samples per year per station. 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. 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 monitoring stations, preparation of monitoring plan and a quality assurance project plan (QAPP) 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 two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have not 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:** 1.0

**Scenario Total Cost:** $59,745.82

**Scenario Cost/Unit:** $59,745.82

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, physi | Hour | $75.84 | 175 | $13,272.00 |
| 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 | Hour | $104.52 | 24 | $2,508.48 |
| 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 prod | Hour | $88.79 | 30 | $2,663.70 |
| 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. | Hour | $31.84 | 364 | $11,589.76 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 18 | $487.08 |
| 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 | $27.06 | 90 | $2,435.40 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 90 | $2,435.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |

**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. 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. 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:** 1.0

**Scenario Total Cost:** $51,540.04

**Scenario Cost/Unit:** $51,540.04

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, physi | Hour | $75.84 | 135 | $10,238.40 |
| 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. | Hour | $31.84 | 364 | $11,589.76 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 18 | $487.08 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 90 | $2,435.40 |
| 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 | $27.06 | 90 | $2,435.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $27.06 | 180 | $4,870.80 |

**Practice:** 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

**Scenario** #31 - Data Collect Tile Year 2+ 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. 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. 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 report, which include some preliminary annual analysis. This scenario will normally be used in year 2 to next to 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 report, 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.

**Feature Measure:** Measuring site

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $51,540.04

**Scenario Cost/Unit:** $51,540.04

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, physi | Hour | $75.84 | 135 | $10,238.40 |
| 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. | Hour | $31.84 | 364 | $11,589.76 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 18 | $487.08 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 90 | $2,435.40 |
| 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 | $27.06 | 90 | $2,435.40 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |

## USDA - Natural Resources Conservation Service

**New York**

**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. 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. 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:** 1.0

**Scenario Total Cost:** $56,090.44

**Scenario Cost/Unit:** $56,090.44

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, physi | Hour | $75.84 | 195 | $14,788.80 |
| 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. | Hour | $31.84 | 364 | $11,589.76 |
| **Materials** | | | | | | |
| Testing, Blanks Samples | 2612 | Blanks or Duplicate Samples; Includes materials only. | Each | $27.06 | 18 | $487.08 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 90 | $2,435.40 |
| 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 | $27.06 | 180 | $4,870.80 |
| 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 | $27.06 | 90 | $2,435.40 |

**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:** 1.0

**Scenario Total Cost:** $19,241.82

**Scenario Cost/Unit:** $19,241.82

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, physi | Hour | $75.84 | 5 | $379.20 |
| 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. | Hour | $31.84 | 60 | $1,910.40 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $2,372.99 | 1 | $2,372.99 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $2,165.14 | 1 | $2,165.14 |
| 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 | $3,016.58 | 1 | $3,016.58 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $760.15 | 1 | $760.15 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,559.13 | 1 | $3,559.13 |
| 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 | $2,556.59 | 1 | $2,556.59 |

## USDA - Natural Resources Conservation Service

**New York**

**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:** 1.0

**Scenario Total Cost:** $20,644.49

**Scenario Cost/Unit:** $20,644.49

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, physi | Hour | $75.84 | 5 | $379.20 |
| 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. | Hour | $31.84 | 60 | $1,910.40 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | $12.24 | 1 | $12.24 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $2,372.99 | 1 | $2,372.99 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $2,165.14 | 1 | $2,165.14 |
| 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 | $3,016.58 | 1 | $3,016.58 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $760.15 | 1 | $760.15 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,559.13 | 1 | $3,559.13 |
| 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 | $2,556.59 | 1 | $2,556.59 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Equipment Shed | 2617 | Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates. | Each | $1,390.43 | 1 | $1,390.43 |

## USDA - Natural Resources Conservation Service

**New York**

**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:** 1.0

**Scenario Total Cost:** $29,767.50

**Scenario Cost/Unit:** $29,767.50

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, physi | Hour | $75.84 | 6 | $455.04 |
| 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. | Hour | $31.84 | 100 | $3,184.00 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | $12.24 | 1 | $12.24 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $2,372.99 | 2 | $4,745.98 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $2,165.14 | 1 | $2,165.14 |
| 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 | $3,016.58 | 2 | $6,033.16 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $760.15 | 2 | $1,520.30 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,559.13 | 1 | $3,559.13 |
| 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 | $1,623.85 | 1 | $1,623.85 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $2,556.59 | 1 | $2,556.59 |
| Equipment Shed | 2617 | Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates. | Each | $1,390.43 | 1 | $1,390.43 |

**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:** 1.0

**Scenario Total Cost:** $29,767.50

**Scenario Cost/Unit:** $29,767.50

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, physi | Hour | $75.84 | 6 | $455.04 |
| 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. | Hour | $31.84 | 100 | $3,184.00 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | $12.24 | 1 | $12.24 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $2,372.99 | 2 | $4,745.98 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $2,165.14 | 1 | $2,165.14 |
| 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 | $3,016.58 | 2 | $6,033.16 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $760.15 | 2 | $1,520.30 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,559.13 | 1 | $3,559.13 |
| 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 | $1,623.85 | 1 | $1,623.85 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | $2,556.59 | 1 | $2,556.59 |
| Equipment Shed | 2617 | Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates. | Each | $1,390.43 | 1 | $1,390.43 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #17 - System Installation-Above&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 recalibrated 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:** 1.0

**Scenario Total Cost:** $29,026.51

**Scenario Cost/Unit:** $29,026.51

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, physi | Hour | $75.84 | 6 | $455.04 |
| 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. | Hour | $31.84 | 60 | $1,910.40 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $2,372.99 | 2 | $4,745.98 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $2,165.14 | 1 | $2,165.14 |
| 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 | $3,016.58 | 2 | $6,033.16 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $760.15 | 2 | $1,520.30 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,559.13 | 2 | $7,118.26 |
| 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 | $2,556.59 | 1 | $2,556.59 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #18 - System Installation-Above&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:** 1.0

**Scenario Total Cost:** $34,388.44

**Scenario Cost/Unit:** $34,388.44

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, physi | Hour | $75.84 | 6 | $455.04 |
| 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. | Hour | $31.84 | 60 | $1,910.40 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | $12.24 | 2 | $24.48 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $2,372.99 | 2 | $4,745.98 |
| Connectors, cables, platform materials | 2607 | Miscellaneous (connectors, cables, berm, platform materials); Includes materials only. | Each | $2,165.14 | 1 | $2,165.14 |
| 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 | $3,016.58 | 2 | $6,033.16 |
| Equipment shelter | 2609 | Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism. | Each | $760.15 | 2 | $1,520.30 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,559.13 | 2 | $7,118.26 |
| 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 | $2,556.59 | 2 | $5,113.18 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Equipment Shed | 2617 | Equipment Shed (10' x 10') made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates. | Each | $1,390.43 | 2 | $2,780.86 |

**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. It is actually to represent a cost for any system updates that has component costs of $2,400 or less as per the component costs in various scenarios.

**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:** 1.0

**Scenario Total Cost:** $3,410.28

**Scenario Cost/Unit:** $3,410.28

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, physi | Hour | $75.84 | 5 | $379.20 |
| 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. | Hour | $31.84 | 16 | $509.44 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |

**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. It is actually to represent a cost for any system updates that has component costs greater than $2,400 but less than or equal to $7,300 as per the component costs in various scenarios.

**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:** 1.0

**Scenario Total Cost:** $9,110.81

**Scenario Cost/Unit:** $9,110.81

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, physi | Hour | $75.84 | 5 | $379.20 |
| 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. | Hour | $31.84 | 20 | $636.80 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $3,016.58 | 1 | $3,016.58 |
| 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 | $2,556.59 | 1 | $2,556.59 |

**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. It is actually to represent a cost for any system updates that has component costs greater than $7,300 but less than or equal to $10,500 as per the component costs in various scenarios. Anything above $10,500 will evaluated as a full system replacement as per scenarios for surface or tile (subsurface) drainage.

**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:** 1.0

**Scenario Total Cost:** $13,052.02

**Scenario Cost/Unit:** $13,052.02

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, physi | Hour | $75.84 | 5 | $379.20 |
| 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. | Hour | $31.84 | 32 | $1,018.88 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.12 | $991.03 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $3,016.58 | 1 | $3,016.58 |
| Pre-calibrated flow control structure-surface | 2610 | Pre-calibrated flow control structure-surface. Used for A202 water quality monitering | Each | $3,559.13 | 1 | $3,559.13 |
| 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 | $2,556.59 | 1 | $2,556.59 |

**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. It is actually to represent a cost for any system updates that has component costs of $3,300 or less as per the component costs in various scenarios.

**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:** 1.0

**Scenario Total Cost:** $4,910.75

**Scenario Cost/Unit:** $4,910.75

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, physi | Hour | $75.84 | 5 | $379.20 |
| 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. | Hour | $31.84 | 32 | $1,018.88 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.24 | $1,982.06 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |

**Practice:** 202 - Edge-of-Field Water Quality Monitoring-System Installation

**Scenario** #23 - System Installation-Retrofit Above 2

**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, and two depth (stage) sensors to be added to existing paired system. It is actually to represent a cost for any system updates that has component costs greater than $3,300 but less than or equal to $13,200 as per the component costs in various scenarios.

**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:** 1.0

**Scenario Total Cost:** $16,132.93

**Scenario Cost/Unit:** $16,132.93

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, physi | Hour | $75.84 | 6 | $455.04 |
| 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. | Hour | $31.84 | 32 | $1,018.88 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 0.24 | $1,982.06 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| 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 | $3,016.58 | 2 | $6,033.16 |
| 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 | $2,556.59 | 2 | $5,113.18 |

**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 building. 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 existing. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

**Feature Measure:** Total Containment Area

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 1,400.0

**Scenario Total Cost:** $20,209.08

**Scenario Cost/Unit:** $14.44

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 Yard | $322.92 | 25 | $8,073.00 |
| 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 Yard | $502.23 | 6 | $3,013.38 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 4 | $292.40 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 14 | $431.76 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $667.87 | 1 | $667.87 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $1.06 | 1400 | $1,484.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $592.43 | 1 | $592.43 |
| 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. | Gallon | $1.44 | 600 | $864.00 |
| Wall, Interior | 2304 | Interior partition wall, 10' high, 2" x 4" studs on 16" center, 3/4" plywood sheething. Includes materials, equipment and labor. | Foot | $70.75 | 36 | $2,547.00 |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4' x 7'. Materials only. | Each | $1,044.91 | 1 | $1,044.91 |
| **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 | $78.09 | 1 | $78.09 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 1,712.0

**Scenario Total Cost:** $37,481.67

**Scenario Cost/Unit:** $21.89

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 Yard | $322.92 | 19 | $6,135.48 |
| 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 Yard | $502.23 | 8 | $4,017.84 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 2024 | $5,606.48 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 2 | $9.66 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 6 | $438.60 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 6 | $236.58 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 27 | $832.68 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 4 | $125.00 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $667.87 | 1 | $667.87 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $6.39 | 2024 | $12,933.36 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yard | $109.47 | 42 | $4,597.74 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $1.06 | 512 | $542.72 |
| **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 | $78.09 | 2 | $156.18 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 640.0

**Scenario Total Cost:** $11,132.44

**Scenario Cost/Unit:** $17.39

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 Yard | $322.92 | 15 | $4,843.80 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 4 | $247.84 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 12 | $877.20 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 16 | $630.88 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 10 | $308.40 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $667.87 | 1 | $667.87 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $1.06 | 640 | $678.40 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $592.43 | 1 | $592.43 |
| 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. | Gallon | $1.44 | 300 | $432.00 |
| 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', electric, manually operated. Includes materials and shipping (pump and motor). | Each | $169.36 | 1 | $169.36 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 Foot

**Scenario Typical Size:** 640.0

**Scenario Total Cost:** $19,254.04

**Scenario Cost/Unit:** $30.08

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 Yard | $322.92 | 15 | $4,843.80 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 4 | $247.84 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 12 | $877.20 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 16 | $630.88 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 10 | $308.40 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $667.87 | 1 | $667.87 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $1.06 | 640 | $678.40 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $592.43 | 1 | $592.43 |
| Roof, Post Frame Building, 30' to 60' wide | 1676 | Post Frame Building, no sides, - 30' to 60' 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 | Square Foot | $8.46 | 960 | $8,121.60 |
| 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. | Gallon | $1.44 | 300 | $432.00 |
| 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', electric, manually operated. Includes materials and shipping (pump and motor). | Each | $169.36 | 1 | $169.36 |
| **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 | $78.09 | 2 | $156.18 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 Foot

**Scenario Typical Size:** 1,400.0

**Scenario Total Cost:** $34,050.83

**Scenario Cost/Unit:** $24.32

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 Yard | $322.92 | 25 | $8,073.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 4 | $247.84 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 12 | $877.20 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 16 | $630.88 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 14 | $431.76 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $667.87 | 1 | $667.87 |
| Painting, concrete surface, impermeable | 1497 | Painting of concrete surfaces with an impermeable coating. Includes materials and application. | Square Foot | $1.06 | 1400 | $1,484.00 |
| Emergency shower and eye wash station | 1499 | Emergency shower and ewe wash station unit. Materials only. | Each | $592.43 | 1 | $592.43 |
| Roof, Post Frame Building, 30' to 60' wide | 1676 | Post Frame Building, no sides, - 30' to 60' 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 | Square Foot | $8.46 | 1400 | $11,844.00 |
| 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. | Gallon | $1.44 | 600 | $864.00 |
| Wall, Interior | 2304 | Interior partition wall, 10' high, 2" x 4" studs on 16" center, 3/4" plywood sheething. Includes materials, equipment and labor. | Foot | $70.75 | 34 | $2,405.50 |
| Wall, Exterior, Metal | 2305 | Exterior wall, 2" x 4" studs on 24" center, 30 gauge galvanized steel sheeting, and one pre-hung door. Includes materials, equipment and labor. | Foot | $89.23 | 34 | $3,033.82 |
| Door, Steel | 2391 | Heavy duty fire rated steel door, full panel flush, 18 gauge, 4' x 7'. Materials only. | Each | $1,044.91 | 1 | $1,044.91 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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', electric, manually operated. Includes materials and shipping (pump and motor). | Each | $169.36 | 1 | $169.36 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 include 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 Foot

**Scenario Typical Size:** 35,058.0

**Scenario Total Cost:** $16,883.08

**Scenario Cost/Unit:** $0.48

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 Yard | $4.83 | 1070 | $5,168.10 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 1070 | $4,237.20 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 348 | $341.04 |
| 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 Yard | $4.17 | 722 | $3,010.74 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 32 | $1,418.24 |
| 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. | Hour | $49.27 | 32 | $1,576.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

## USDA - Natural Resources Conservation Service

**New York**

**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 include 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 Foot

**Scenario Typical Size:** 123,600.0

**Scenario Total Cost:** $44,113.52

**Scenario Cost/Unit:** $0.36

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 Yard | $4.83 | 2080 | $10,046.40 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 2080 | $8,236.80 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 60 | $8,225.40 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 60 | $5,847.00 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 1480 | $1,450.40 |
| **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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 120 | $4,731.60 |
| 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. | Hour | $49.27 | 60 | $2,956.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 include 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 Foot

**Scenario Typical Size:** 255,900.0

**Scenario Total Cost:** $71,180.60

**Scenario Cost/Unit:** $0.28

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 Yard | $4.83 | 3960 | $19,126.80 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 5500 | $21,780.00 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 1900 | $1,862.00 |
| 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 Yard | $4.17 | 4500 | $18,765.00 |
| **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. | Hour | $44.32 | 80 | $3,545.60 |
| 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. | Hour | $49.27 | 80 | $3,941.60 |
| **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 | $539.90 | 4 | $2,159.60 |

## USDA - Natural Resources Conservation Service

**New York**

**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 include 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 Foot

**Scenario Typical Size:** 146,970.0

**Scenario Total Cost:** $172,530.21

**Scenario Cost/Unit:** $1.17

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 Yard | $4.83 | 10430 | $50,376.90 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 10430 | $41,302.80 |
| 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. | Hour | $181.78 | 75 | $13,633.50 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 741 | $726.18 |
| 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 Yard | $4.17 | 9689 | $40,403.13 |
| 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 | $0.37 | 48445 | $17,924.65 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 32 | $1,418.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 75 | $2,957.25 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 32 | $1,576.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 14,333.0

**Scenario Total Cost:** $97,161.18

**Scenario Cost/Unit:** $6.78

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 Yard | $322.92 | 12 | $3,875.04 |
| 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 Yard | $502.23 | 16 | $8,035.68 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 80 | $386.40 |
| 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 Yard | $4.17 | 80 | $333.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 15 | $468.75 |
| 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 Foot | $5.82 | 14333 | $83,418.06 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 73,084.0

**Scenario Total Cost:** $195,064.12

**Scenario Cost/Unit:** $2.67

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 Yard | $322.92 | 63 | $20,343.96 |
| 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 Yard | $502.23 | 36 | $18,080.28 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 240 | $1,159.20 |
| 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 Yard | $4.17 | 320 | $1,334.40 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 71 | $2,218.75 |
| 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 Foot | $2.07 | 73084 | $151,283.88 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 187,094.0

**Scenario Total Cost:** $397,581.32

**Scenario Cost/Unit:** $2.13

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 Yard | $322.92 | 152 | $49,083.84 |
| 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 Yard | $502.23 | 59 | $29,631.57 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 550 | $2,656.50 |
| 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 Yard | $4.17 | 730 | $3,044.10 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 182 | $5,687.50 |
| 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 Foot | $1.64 | 187094 | $306,834.16 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 248,200.0

**Scenario Total Cost:** $550,712.44

**Scenario Cost/Unit:** $2.22

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 Yard | $159.14 | 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 Yard | $322.92 | 202 | $65,229.84 |
| 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 Yard | $502.23 | 68 | $34,151.64 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 1240 | $5,989.20 |
| 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 Yard | $4.17 | 1240 | $5,170.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 227 | $7,093.75 |
| 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 Foot | $1.74 | 248200 | $431,868.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 Foot

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $2,411.80

**Scenario Cost/Unit:** $0.60

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 Yard | $4.83 | 148 | $714.84 |
| 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 Yard | $4.17 | 148 | $617.16 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 Foot

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $18,076.64

**Scenario Cost/Unit:** $4.52

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 Yard | $502.23 | 18 | $9,040.14 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 148 | $714.84 |
| 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 Yard | $4.17 | 148 | $617.16 |
| **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. | Hour | $24.81 | 90 | $2,232.90 |
| 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. | Hour | $49.27 | 20 | $985.40 |
| **Materials** | | | | | | |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Foot | $0.92 | 1600 | $1,472.00 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | $1.55 | 1248 | $1,934.40 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 Foot

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $45,559.62

**Scenario Cost/Unit:** $11.39

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 Yard | $502.23 | 80 | $40,178.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 148 | $714.84 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 108 | $689.04 |
| 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. | Hour | $69.35 | 16 | $1,109.60 |
| 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 Yard | $4.17 | 148 | $617.16 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 16 | $630.88 |
| **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 | $539.90 | 3 | $1,619.70 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #12 - Dry Stack,<2K Conc 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 Foot

**Scenario Typical Size:** 1,600.0

**Scenario Total Cost:** $29,695.70

**Scenario Cost/Unit:** $18.56

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 Yard | $322.92 | 23 | $7,427.16 |
| 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 Yard | $502.23 | 38 | $19,084.74 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 30 | $144.90 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 8 | $779.60 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 30 | $925.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 313 - Waste Storage Facility

**Scenario** #13 - Dry Stack, 2K> Concr 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 Foot

**Scenario Typical Size:** 6,000.0

**Scenario Total Cost:** $76,850.02

**Scenario Cost/Unit:** $12.81

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 Yard | $322.92 | 89 | $28,739.88 |
| 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 Yard | $502.23 | 81 | $40,680.63 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 112 | $540.96 |
| 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 Yard | $4.17 | 445 | $1,855.65 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 112 | $3,500.00 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 Foot

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $25,033.76

**Scenario Cost/Unit:** $6.26

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 Yard | $322.92 | 64 | $20,666.88 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 74 | $357.42 |
| 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 Yard | $4.17 | 148 | $617.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 74 | $2,312.50 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 Foot

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $35,695.36

**Scenario Cost/Unit:** $8.92

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 Yard | $322.92 | 64 | $20,666.88 |
| 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 Yard | $502.23 | 10 | $5,022.30 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 74 | $357.42 |
| 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 Yard | $4.17 | 148 | $617.16 |
| **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. | Hour | $24.81 | 90 | $2,232.90 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 74 | $2,312.50 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Foot | $0.92 | 1600 | $1,472.00 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | $1.55 | 1248 | $1,934.40 |
| **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 | $539.90 | 2 | $1,079.80 |

**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. 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).

**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:** Struck Full Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 3,840.0

**Scenario Total Cost:** $30,362.84

**Scenario Cost/Unit:** $7.91

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 Yard | $322.92 | 12 | $3,875.04 |
| 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 Yard | $502.23 | 36 | $18,080.28 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 150 | $957.00 |
| 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. | Hour | $125.73 | 14 | $1,760.22 |
| 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 | Hour | $182.75 | 8 | $1,462.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 14 | $552.02 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 17 | $524.28 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 104 | $611.52 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 125 | $152.50 |
| **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 | $78.09 | 6 | $468.54 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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.. Design volume does not include freeboard. 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), 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 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, with a bottom area of 1256 SF, and a design storage volume of 9,420 cubic feet plus 6" freeboard. Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Volume does not include 6" of freeboard. Payment based on Struck full volume = 10,048

**Feature Measure:** Struck Full Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 10,048.0

**Scenario Total Cost:** $35,053.17

**Scenario Cost/Unit:** $3.49

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 Yard | $322.92 | 28 | $9,041.76 |
| 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 Yard | $502.23 | 26 | $13,057.98 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 200 | $1,276.00 |
| 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. | Hour | $125.73 | 24 | $3,017.52 |
| 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 | Hour | $182.75 | 8 | $1,462.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 48 | $1,892.64 |
| 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. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 33 | $1,031.25 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 126 | $740.88 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 152 | $185.44 |
| **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 | $78.09 | 6 | $468.54 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 6 | $1,696.68 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 313 - Waste Storage Facility

**Scenario** #18 - Tank, Partially or Totally Buried 15K<25K

**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. The 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).

**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 is typically 8 ft deep, with a bottom area of 2122 sq.ft., and a design 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 does not include the 6” of freeboard. Payment based on Struck Full Volume = 16979 cf

**Feature Measure:** Struck Full Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 16,979.0

**Scenario Total Cost:** $52,770.04

**Scenario Cost/Unit:** $3.11

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 Yard | $322.92 | 45 | $14,531.40 |
| 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 Yard | $502.23 | 34 | $17,075.82 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 240 | $1,531.20 |
| 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. | Hour | $125.73 | 32 | $4,023.36 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 32 | $3,118.40 |
| 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 | Hour | $182.75 | 10 | $1,827.50 |
| **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. | Hour | $44.32 | 32 | $1,418.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 64 | $2,523.52 |
| 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. | Hour | $49.27 | 32 | $1,576.64 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 52 | $1,625.00 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 163 | $958.44 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 196 | $239.12 |
| **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 | $78.09 | 8 | $624.72 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 6 | $1,696.68 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 313 - Waste Storage Facility

**Scenario** #19 - Tank, 25K<40K

**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. The 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), 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 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 installed is 10' deep, with a bottom area of 2,947 SF, and a design storage volume of 28,000 cubic feet plus 6" freeboard. Size based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Calculated volume for scenario does not include the 6” of freeboard. Payment based on Struck Full Volume = 29,470 CF used for this scenario.

**Feature Measure:** Struck Full Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 29,470.0

**Scenario Total Cost:** $69,669.59

**Scenario Cost/Unit:** $2.36

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 Yard | $322.92 | 62 | $20,021.04 |
| 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 Yard | $502.23 | 49 | $24,609.27 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 350 | $2,233.00 |
| 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. | Hour | $181.78 | 36 | $6,544.08 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 36 | $3,508.20 |
| 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 | Hour | $182.75 | 12 | $2,193.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 72 | $2,838.96 |
| 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. | Hour | $49.27 | 32 | $1,576.64 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 70 | $2,187.50 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 192 | $1,128.96 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 288 | $351.36 |
| **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 | $78.09 | 10 | $780.90 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 6 | $1,696.68 |

## USDA - Natural Resources Conservation Service

**New York**

**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. The 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), 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 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 installed is 10' deep, with a inside bottom area of 4,600 SF, and a storage volume of 43,700 cubic feet plus 6" freeboard. Payment based on design storage volume of 46,000 CF which includes regulatory freeboard and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Design Storage Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 46,000.0

**Scenario Total Cost:** $99,809.80

**Scenario Cost/Unit:** $2.17

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 Yard | $322.92 | 91 | $29,385.72 |
| 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 Yard | $502.23 | 77 | $38,671.71 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 426 | $2,717.88 |
| 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. | Hour | $181.78 | 50 | $9,089.00 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 50 | $4,872.50 |
| 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 | Hour | $182.75 | 12 | $2,193.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 100 | $3,943.00 |
| 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. | Hour | $49.27 | 30 | $1,478.10 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 103 | $3,218.75 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 240 | $1,411.20 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 288 | $351.36 |
| **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 | $78.09 | 10 | $780.90 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 6 | $1,696.68 |

**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. The 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), 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 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 12' deep, with a bottom area of 5,391 SF, and a storage volume of 62,000 CF plus 6" freeboard. Payment based on design storage volume of 64,692 CF which includes regulatory freeboard and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Design Storage Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 64,692.0

**Scenario Total Cost:** $123,706.09

**Scenario Cost/Unit:** $1.91

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 Yard | $322.92 | 107 | $34,552.44 |
| 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 Yard | $502.23 | 99 | $49,720.77 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 650 | $4,147.00 |
| 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. | Hour | $181.78 | 66 | $11,997.48 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 66 | $6,431.70 |
| 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 | Hour | $182.75 | 12 | $2,193.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 132 | $5,204.76 |
| 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. | Hour | $49.27 | 30 | $1,478.10 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 120 | $3,750.00 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 260 | $1,528.80 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 312 | $380.64 |
| **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 | $78.09 | 8 | $624.72 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 6 | $1,696.68 |

**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. The 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), 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 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 12' deep, with a bottom area of 6500.6 SF, and a storage volume of 74757 CF plus 6" freeboard. Payment based on design storage volume of 78,007 CF which includes regulatory freeboard and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Design Storage Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 78,007.0

**Scenario Total Cost:** $141,397.25

**Scenario Cost/Unit:** $1.81

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 Yard | $322.92 | 127 | $41,010.84 |
| 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 Yard | $502.23 | 109 | $54,743.07 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 700 | $4,466.00 |
| 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. | Hour | $181.78 | 80 | $14,542.40 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 80 | $7,796.00 |
| 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 | Hour | $182.75 | 12 | $2,193.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 160 | $6,308.80 |
| 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. | Hour | $49.27 | 30 | $1,478.10 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 142 | $4,437.50 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 286 | $1,681.68 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 343 | $418.46 |
| **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 | $78.09 | 8 | $624.72 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 6 | $1,696.68 |

**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. The 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), 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 environmentally 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 typically 12' deep, with a bottom area of 8,044 SF, and a storage capacity of 92,500 cubic feet plus 6" freeboard. Payment based on design storage volume of 95,528 CF which includes regulatory freeboard and all other applicable items listed in the 3131 practice standard.

**Feature Measure:** Design Storage Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 95,528.0

**Scenario Total Cost:** $143,827.36

**Scenario Cost/Unit:** $1.51

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 Yard | $322.92 | 154 | $49,729.68 |
| 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 Yard | $502.23 | 121 | $60,769.83 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 800 | $5,104.00 |
| 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. | Hour | $181.78 | 8 | $1,454.24 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 8 | $779.60 |
| 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 | Hour | $182.75 | 14 | $2,558.50 |
| 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 Yard | $4.17 | 2700 | $11,259.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 16 | $630.88 |
| 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. | Hour | $49.27 | 30 | $1,478.10 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 173 | $5,406.25 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 318 | $1,869.84 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 382 | $466.04 |

**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 | $78.09 | 8 | $624.72 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 6 | $1,696.68 |

**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. The 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), 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 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 14' deep with a bottom area of 11,304 SF and a storage volume of 152,600 CF plus 6" freeboard. Payment based on design storage volume of 158,256 CF which includes regulatory freeboard and all other applicable items listed in the 313 practice standard.

**Feature Measure:** Design Storage Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 158,256.0

**Scenario Total Cost:** $205,789.22

**Scenario Cost/Unit:** $1.30

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 Yard | $322.92 | 206 | $66,521.52 |
| 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 Yard | $502.23 | 167 | $83,872.41 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 1400 | $8,932.00 |
| 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. | Hour | $181.78 | 24 | $4,362.72 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 24 | $2,338.80 |
| 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 | Hour | $182.75 | 14 | $2,558.50 |
| 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 Yard | $4.17 | 4700 | $19,599.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 48 | $1,892.64 |
| 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. | Hour | $49.27 | 64 | $3,153.28 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 239 | $7,468.75 |
| Waterstop, PVC, ribbed, 3/16" x 6" | 1614 | Waterstop, PVC, ribbed, 3/16" thick by 6"wide. Includes materials, equipment and labor. | Foot | $5.88 | 377 | $2,216.76 |
| Pipe, HDPE, 4" CPT, Single Wall with Filter Sock | 2068 | 4" plastic tile with filter sock. Materials only. | Foot | $1.22 | 452 | $551.44 |
| **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 | $78.09 | 8 | $624.72 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 6 | $1,696.68 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,384.09

**Scenario Cost/Unit:** $338.41

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 25 | $120.75 |
| Brush Chipper, 6" capacity | 938 | Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hour | $23.48 | 25 | $587.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 25 | $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. | Hour | $44.32 | 25 | $1,108.00 |
| 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. | Hour | $24.81 | 50 | $1,240.50 |
| **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 | $78.09 | 2 | $156.18 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,076.78

**Scenario Cost/Unit:** $507.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 25 | $120.75 |
| Brush Chipper, 6" capacity | 938 | Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hour | $23.48 | 25 | $587.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 3 | $72.24 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| 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. | Hour | $71.74 | 20 | $1,434.80 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 25 | $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. | Hour | $44.32 | 25 | $1,108.00 |
| 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. | Hour | $24.81 | 50 | $1,240.50 |
| **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. | Acre | $37.13 | 5 | $185.65 |
| **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 | $78.09 | 2 | $156.18 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,302.30

**Scenario Cost/Unit:** $130.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 10 | $573.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 10 | $251.80 |
| **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 | $190.19 | 2 | $380.38 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $7,476.04

**Scenario Cost/Unit:** $747.60

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 6 | $144.48 |
| Feller buncher | 941 | Equipment and power unit costs. Labor not included. | Hour | $129.72 | 40 | $5,188.80 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 40 | $1,577.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,280.50

**Scenario Cost/Unit:** $528.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 30 | $1,721.40 |
| 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. | Hour | $71.74 | 30 | $2,152.20 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 30 | $755.40 |
| **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. | Acre | $17.48 | 10 | $174.80 |
| **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 | $190.19 | 2 | $380.38 |

**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::** Acre

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $1,092.10

**Scenario Cost/Unit:** $218.42

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. | Hour | $71.74 | 5 | $358.70 |
| **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. | Hour | $104.31 | 5 | $521.55 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 5 | $211.85 |

**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. Undesirable species consist of hardwoods and shrubs that can propagate 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $897.02

**Scenario Cost/Unit:** $897.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| 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. | Hour | $71.74 | 8 | $573.92 |
| **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. | Hour | $49.27 | 4 | $197.08 |
| **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. | Acre | $37.13 | 0.8 | $29.70 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $4,794.10

**Scenario Cost/Unit:** $479.41

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. | Hour | $84.38 | 30 | $2,531.40 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 30 | $1,182.90 |
| **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 | $539.90 | 2 | $1,079.80 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $24,024.68

**Scenario Cost/Unit:** $150.15

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Chemical, ground application, wildland | 1313 | Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs. | Acre | $129.26 | 160 | $20,681.60 |
| **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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acre | $16.93 | 160 | $2,708.80 |
| 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 shi | Acre | $1.28 | 160 | $204.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 315 - Herbaceous Weed Control

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,617.92

**Scenario Cost/Unit:** $161.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 4 | $125.04 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 40 | $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. | Hour | $24.81 | 40 | $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. | Hour | $49.27 | 2 | $98.54 |
| **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 | $78.09 | 2 | $156.18 |

**Practice:** 315 - Herbaceous Weed Control

**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 Habitat 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,302.30

**Scenario Cost/Unit:** $130.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 10 | $573.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 10 | $251.80 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** 315 - Herbaceous Weed Control

**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 Habitat 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $1,775.93

**Scenario Cost/Unit:** $88.80

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| 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. | Hour | $71.74 | 20 | $1,434.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 5 | $156.30 |
| **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. | Hour | $49.27 | 1 | $49.27 |
| **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. | Acre | $17.48 | 5 | $87.40 |

**Practice:** 315 - Herbaceous Weed Control

**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 Habitat 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $696.98

**Scenario Cost/Unit:** $34.85

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. | Acre | $6.78 | 20 | $135.60 |
| **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. | Acre | $7.77 | 20 | $155.40 |
| 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 shi | Acre | $1.28 | 20 | $25.60 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** 315 - Herbaceous Weed Control

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,045.35

**Scenario Cost/Unit:** $202.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application, wildland | 1313 | Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs. | Acre | $129.26 | 20 | $2,585.20 |
| **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. | Hour | $104.31 | 7 | $730.17 |
| **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. | Acre | $17.48 | 20 | $349.60 |
| **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 | $190.19 | 2 | $380.38 |

**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 Foot

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $2,239.62

**Scenario Cost/Unit:** $0.90

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 Yard | $2.56 | 150 | $384.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 150 | $724.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 Foot

**Scenario Typical Size:** 5,700.0

**Scenario Total Cost:** $8,294.13

**Scenario Cost/Unit:** $1.46

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 | $2.77 | 633 | $1,753.41 |
| 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 Yard | $2.56 | 140 | $358.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 140 | $676.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 140 | $4,375.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 Foot

**Scenario Typical Size:** 5,700.0

**Scenario Total Cost:** $39,568.82

**Scenario Cost/Unit:** $6.94

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 Yard | $322.92 | 105.5 | $34,068.06 |
| 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 Yard | $2.56 | 220 | $563.20 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 105.5 | $509.57 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 105.5 | $3,296.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 Foot

**Scenario Typical Size:** 5,700.0

**Scenario Total Cost:** $42,016.64

**Scenario Cost/Unit:** $7.37

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 Yard | $322.92 | 105.5 | $34,068.06 |
| 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 Yard | $502.23 | 6 | $3,013.38 |
| 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 Yard | $2.56 | 220 | $563.20 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 105.5 | $509.57 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 105.5 | $3,296.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 720.0

**Scenario Total Cost:** $13,943.25

**Scenario Cost/Unit:** $19.37

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 Yard | $322.92 | 19.25 | $6,216.21 |
| 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 Yard | $502.23 | 2.5 | $1,255.58 |
| 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 Yard | $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. | Hour | $44.32 | 80 | $3,545.60 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 19.25 | $601.56 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Foot | $0.92 | 880 | $809.60 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | $1.55 | 448 | $694.40 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 960.0

**Scenario Total Cost:** $14,566.23

**Scenario Cost/Unit:** $15.17

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 Yard | $322.92 | 18 | $5,812.56 |
| 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 Yard | $502.23 | 15 | $7,533.45 |
| 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 Yard | $2.56 | 36 | $92.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 18 | $562.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 concrete slab (5") and curbing and installing wooden walls.

**Feature Measure:** Total Bin Capacity

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 576.0

**Scenario Total Cost:** $8,866.27

**Scenario Cost/Unit:** $15.39

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 Yard | $159.14 | 2 | $318.28 |
| 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 Yard | $322.92 | 9 | $2,906.28 |
| 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 Yard | $502.23 | 1.5 | $753.35 |
| 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 Yard | $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. | Hour | $49.30 | 4 | $197.20 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | $8.08 | 4 | $32.32 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 7 | $218.75 |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Foot | $0.92 | 992 | $912.64 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | $1.55 | 384 | $595.20 |
| **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 | $78.09 | 2 | $156.18 |
| 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 | $190.19 | 2 | $380.38 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Foot

**Scenario Typical Size:** 32,670.0

**Scenario Total Cost:** $12,535.36

**Scenario Cost/Unit:** $0.38

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 Yard | $4.83 | 1210 | $5,844.30 |
| 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 Yard | $4.17 | 1210 | $5,045.70 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

## USDA - Natural Resources Conservation Service

**New York**

**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 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 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 Foot

**Scenario Typical Size:** 32,670.0

**Scenario Total Cost:** $43,465.16

**Scenario Cost/Unit:** $1.33

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 | $2.77 | 3630 | $10,055.10 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 1210 | $5,844.30 |
| 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 Yard | $4.17 | 1815 | $7,568.55 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 605 | $18,906.25 |
| **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 | $78.09 | 1 | $78.09 |
| 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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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'), placement of compacted gravel (4"), and installing 6" of reinforced concrete.

**Feature Measure:** Square Foot Floor Area

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 32,670.0

**Scenario Total Cost:** $233,093.48

**Scenario Cost/Unit:** $7.13

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 Yard | $322.92 | 605 | $195,366.60 |
| 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 Yard | $502.23 | 20 | $10,044.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 605 | $2,922.15 |
| 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 Yard | $4.17 | 1210 | $5,045.70 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 605 | $18,906.25 |
| **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 | $78.09 | 1 | $78.09 |
| 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 | $190.19 | 1 | $190.19 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Yard

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $5,364.42

**Scenario Cost/Unit:** $1,341.11

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 Yard | $322.92 | 4.2 | $1,356.26 |
| 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 Yard | $502.23 | 4.3 | $2,159.59 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hour | $101.16 | 2 | $202.32 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 2 | $78.86 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 4.2 | $131.25 |
| Pipe, PVC, 2", SCH 40 | 976 | Materials: - 2" - PVC - SCH 40 - ASTM D1785 | Foot | $1.34 | 30 | $40.20 |
| Fuel Containment Facility, Gate valve 2 inch diameter | 1735 | Metal 2 inch diameter gate valve. Materials only. | Each | $279.32 | 1 | $279.32 |
| **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 | $78.09 | 1 | $78.09 |
| 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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

**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::** Gallon

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $3,152.01

**Scenario Cost/Unit:** $3.15

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. | Hour | $101.16 | 1 | $101.16 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 1 | $39.43 |
| **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. | Gallon | $2.64 | 1000 | $2,640.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 319 - On-Farm Secondary Containment Facility

**Scenario** #13 - Double Wall Tank

**Scenario Description:**

This practice scenario includes the replacement of an existing single wall fuel storage tank with a new double wall 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 an existing single wall 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 the replacement of an existing single wall tank(s) with a new double wall tank(s). Installation of "used" double wall tank(s) will not be allowed. A 3000 gallon horizontal or vertical antiroll tank (U/L 142-23 Secondary Containment Vessel) double walled which meets EPA regulations will be installed. Payment Schedule is based on the cost difference between a new single wall tank and new double wall tank of the same size. The double wall tank 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:** Tank volume

**Scenario Unit::** Gallon

**Scenario Typical Size:** 3,000.0

**Scenario Total Cost:** $4,105.09

**Scenario Cost/Unit:** $1.37

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. | Hour | $101.16 | 2 | $202.32 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 2 | $78.86 |
| **Materials** | | | | | | |
| Tank, storage tank, upgrade to a double wall from a single wall, horizontal, steel, above ground, variable cost portion | 2260 | Variable cost portion of the difference between a single wall and double wall horizontal steel storage tank. Includes cradles, coating, fittings, labor, equipment. Excludes foundations, pumps or piping. | Gallon | $0.97 | 3000 | $2,910.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Acre

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $2,044.72

**Scenario Cost/Unit:** $25.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| Ripper or subsoiler, 16 to 36 inch depth | 1235 | Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor. | Acre | $22.03 | 80 | $1,762.40 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | $104.31 | 2 | $208.62 |

**Practice:** 325 - High Tunnel System

**Scenario** #16 - High Tunnel

**Scenario Description:**

Used for contiguous US states in areas with low or no snowfall. A quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications. Associated Practices: Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed (329), Cover Crop (340), Residue Management , Seasonal (344), Residue and Tillage Management, Mulch Till (345), Nutrient Management (590), Pest Management (595).

**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, plant condition, and energy use.

**After Situation:**

A seasonal high tunnel has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved and there is decreased energy use by producing food locally.

**Feature Measure:** Area of Tunnel Installed

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 2,160.0

**Scenario Total Cost:** $9,130.31

**Scenario Cost/Unit:** $4.23

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. | Hour | $24.81 | 71 | $1,761.51 |
| **Materials** | | | | | | |
| Hoop House, quonset style, base package | 1277 | Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and polylock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only, does n | Square Foot | $3.18 | 2160 | $6,868.80 |
| **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 i | Dollar | $1.00 | 500 | $500.00 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 325 - High Tunnel System

**Scenario** #47 - 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.) covered with 4-year 4 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 Foot

**Scenario Typical Size:** 2,160.0

**Scenario Total Cost:** $11,842.71

**Scenario Cost/Unit:** $5.48

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. | Hour | $24.81 | 71 | $1,761.51 |
| **Materials** | | | | | | |
| Hoop House, gothic style, base package | 1278 | 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 | Square Foot | $4.32 | 2160 | $9,331.20 |
| **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 i | Dollar | $1.00 | 750 | $750.00 |

**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 deposition 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 equilibrium with the flow.

**Feature Measure:** Linear Feet

**Scenario Unit::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $3,720.90

**Scenario Cost/Unit:** $18.60

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. | Hour | $73.10 | 6 | $438.60 |
| 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. | Hour | $125.73 | 6 | $754.38 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 12 | $57.96 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 8 | $508.96 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 24 | $604.32 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 deposition 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 equilibrium with the flow.

**Feature Measure:** Linear Feet

**Scenario Unit::** Foot

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $5,621.98

**Scenario Cost/Unit:** $18.74

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. | Hour | $137.09 | 10 | $1,370.90 |
| 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. | Hour | $125.73 | 10 | $1,257.30 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 20 | $96.60 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 10 | $636.20 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 32 | $805.76 |
| 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. | Hour | $49.27 | 10 | $492.70 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 deposition 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 equilibrium with the flow.

**Feature Measure:** Linear Feet

**Scenario Unit::** Foot

**Scenario Typical Size:** 400.0

**Scenario Total Cost:** $8,473.32

**Scenario Cost/Unit:** $21.18

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. | Hour | $137.09 | 16 | $2,193.44 |
| 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. | Hour | $125.73 | 16 | $2,011.68 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 30 | $144.90 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 16 | $1,017.92 |
| **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. | Hour | $24.81 | 30 | $744.30 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 40 | $1,007.20 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $8,902.00

**Scenario Cost/Unit:** $178.04

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. | Acre | $12.32 | 150 | $1,848.00 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 50 | $365.50 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acre | $22.70 | 50 | $1,135.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 50 | $1,180.50 |
| **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 | $0.60 | 2500 | $1,500.00 |
| 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 | $0.64 | 2000 | $1,280.00 |
| One Species, Cool Season, Introduced Perennial Grass | 2313 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $31.86 | 50 | $1,593.00 |

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $9,902.50

**Scenario Cost/Unit:** $198.05

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. | Acre | $12.32 | 150 | $1,848.00 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acre | $22.70 | 100 | $2,270.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 50 | $1,180.50 |
| **Materials** | | | | | | |
| Two Species Mix, Warm Season, Native Perennial Grass | 2325 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $92.08 | 50 | $4,604.00 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,433.84

**Scenario Cost/Unit:** $121.69

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. | Acre | $12.32 | 24 | $295.68 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 12 | $87.72 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acre | $22.70 | 24 | $544.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 12 | $283.32 |
| **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 | $0.60 | 600 | $360.00 |
| 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 | $0.64 | 480 | $307.20 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 480 | $172.80 |
| One Species, Cool Season, Introduced Perennial Grass | 2313 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $31.86 | 12 | $382.32 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $614.79

**Scenario Cost/Unit:** $614.79

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. | Acre | $12.32 | 3 | $36.96 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acre | $22.70 | 2 | $45.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Materials** | | | | | | |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 2 | $508.82 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $906.01

**Scenario Cost/Unit:** $906.01

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. | Acre | $12.32 | 3 | $36.96 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acre | $22.70 | 2 | $45.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Materials** | | | | | | |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 1.4 | $800.04 |

**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::** Acre

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $1,478.10

**Scenario Cost/Unit:** $7.39

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. | Hour | $49.27 | 30 | $1,478.10 |

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,970.80

**Scenario Cost/Unit:** $39.42

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. | Hour | $49.27 | 40 | $1,970.80 |

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,222.50

**Scenario Cost/Unit:** $22.23

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. | Acre | $23.61 | 50 | $1,180.50 |
| 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. | Acre | $20.84 | 50 | $1,042.00 |

**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:** 1.0

**Scenario Total Cost:** $3,411.98

**Scenario Cost/Unit:** $3,411.98

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. | Acre | $23.61 | 7.5 | $177.08 |
| 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. | Acre | $20.84 | 7.5 | $156.30 |
| **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. | Hour | $24.81 | 40 | $992.40 |
| 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. | Hour | $104.31 | 20 | $2,086.20 |

**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::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $297.79

**Scenario Cost/Unit:** $9.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 5 | $125.90 |
| 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. | Hour | $49.27 | 3 | $147.81 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $297.79

**Scenario Cost/Unit:** $29.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 5 | $125.90 |
| 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. | Hour | $49.27 | 3 | $147.81 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $493.08

**Scenario Cost/Unit:** $493.08

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. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 1 | $376.15 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 1 | $69.06 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $497.48

**Scenario Cost/Unit:** $497.48

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. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 1 | $376.15 |
| **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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 20 | $12.80 |
| Sulfate of Potash | 263 | Approved for Organic Systems - Muriate of Potash | Pound | $0.69 | 20 | $13.80 |
| 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. | Acre | $17.48 | 1 | $17.48 |
| One Species, Cool Season, Introduced Perennial Grass | 2313 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $31.86 | 1 | $31.86 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $639.18

**Scenario Cost/Unit:** $639.18

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. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 1 | $376.15 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 1 | $215.16 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,209.52

**Scenario Cost/Unit:** $1,209.52

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. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Foregone Income** | | | | | | |
| FI, Vegetables | 2033 | Vegetables is Primary Crop | Acre | $1,092.59 | 1 | $1,092.59 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 1 | $69.06 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,213.92

**Scenario Cost/Unit:** $1,213.92

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. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Foregone Income** | | | | | | |
| FI, Vegetables | 2033 | Vegetables is Primary Crop | Acre | $1,092.59 | 1 | $1,092.59 |
| **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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 20 | $12.80 |
| Sulfate of Potash | 263 | Approved for Organic Systems - Muriate of Potash | Pound | $0.69 | 20 | $13.80 |
| 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. | Acre | $17.48 | 1 | $17.48 |
| One Species, Cool Season, Introduced Perennial Grass | 2313 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $31.86 | 1 | $31.86 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,355.62

**Scenario Cost/Unit:** $1,355.62

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. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Foregone Income** | | | | | | |
| FI, Vegetables | 2033 | Vegetables is Primary Crop | Acre | $1,092.59 | 1 | $1,092.59 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 1 | $215.16 |

**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::** Acre

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $11,890.40

**Scenario Cost/Unit:** $59.45

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. | Hour | $44.32 | 80 | $3,545.60 |
| 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. | Hour | $104.31 | 80 | $8,344.80 |

**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 accumulation 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 undesirable 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 wildfire 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $1,743.80

**Scenario Cost/Unit:** $87.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 8 | $250.08 |
| 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. | Hour | $2.68 | 8 | $21.44 |
| **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. | Hour | $44.32 | 16 | $709.12 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Fuel, ignition fuel mixture | 1596 | Mixture of gasoline and diesel for ignition of prescribed burns. Materials only. | Gallon | $4.32 | 2 | $8.64 |
| **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 | $78.09 | 2 | $156.18 |

**Practice:** 340 - Cover Crop

**Scenario** #1 - Cover Crop - Basic and organic/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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $3,445.20

**Scenario Cost/Unit:** $86.13

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. | Acre | $6.78 | 40 | $271.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 40 | $944.40 |
| **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. | Acre | $17.48 | 40 | $699.20 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 40 | $1,530.40 |

**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:** Area planted

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,884.30

**Scenario Cost/Unit:** $2,884.30

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. | Acre | $6.78 | 10 | $67.80 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| **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. | Hour | $44.32 | 20 | $886.40 |
| 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. | Hour | $24.81 | 40 | $992.40 |
| **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. | Acre | $17.48 | 10 | $174.80 |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 10 | $526.80 |

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $4,022.00

**Scenario Cost/Unit:** $100.55

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. | Acre | $6.78 | 40 | $271.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 40 | $944.40 |
| **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. | Acre | $17.48 | 40 | $699.20 |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 40 | $2,107.20 |

**Practice:** 342 - Critical Area Planting

**Scenario** #1 - 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $357.39

**Scenario Cost/Unit:** $357.39

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. | Acre | $12.32 | 2 | $24.64 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 60 | $38.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 60 | $21.60 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 2 | $186.46 |
| One Species, Cool Season, Introduced Perennial Grass | 2313 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $31.86 | 1 | $31.86 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 342 - Critical Area Planting

**Scenario** #4 - Native and Introduced Vegetation - Moderate Grading

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $813.91

**Scenario Cost/Unit:** $813.91

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. | Hour | $73.10 | 4 | $292.40 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 2 | $24.64 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| **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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 60 | $38.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 60 | $21.60 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 2 | $186.46 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 1 | $38.26 |

**Practice:** 342 - Critical Area Planting

**Scenario** #6 - Native or Introduced Grass/legume mix-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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,278.45

**Scenario Cost/Unit:** $1,278.45

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. | Hour | $73.10 | 8 | $584.80 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 2 | $24.64 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| **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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 60 | $38.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 60 | $21.60 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 2 | $186.46 |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 1 | $52.68 |

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,361.00

**Scenario Cost/Unit:** $23.61

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. | Acre | $23.61 | 100 | $2,361.00 |

**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:** Area planted

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,136.50

**Scenario Cost/Unit:** $4,136.50

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. | Acre | $12.32 | 20 | $246.40 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 20 | $367.00 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| 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. | Acre | $20.84 | 10 | $208.40 |
| **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. | Hour | $24.81 | 40 | $992.40 |
| 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. | Hour | $104.31 | 20 | $2,086.20 |

**Practice:** 350 - Sediment Basin

**Scenario** #1 - Excavated volume

**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 Yard

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $4,342.74

**Scenario Cost/Unit:** $2.90

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. | Hour | $137.09 | 23 | $3,153.07 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 23 | $906.89 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Yard

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $4,342.74

**Scenario Cost/Unit:** $2.90

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. | Hour | $137.09 | 23 | $3,153.07 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 23 | $906.89 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Yard

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $8,944.87

**Scenario Cost/Unit:** $5.96

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 Yard | $502.23 | 3 | $1,506.69 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 23 | $3,153.07 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 23 | $906.89 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 19.6 | $604.46 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1.6 | $50.00 |
| Pipe, CMP, 18-16 gauge, weight priced | 1322 | 18 & 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only. | Pound | $1.08 | 1662 | $1,794.96 |
| 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 | $2.47 | 118 | $291.46 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $1,073.49

**Scenario Cost/Unit:** $71.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 0.6 | $3.83 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 1 | $61.96 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1.5 | $46.88 |
| 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 Yard | $935.78 | 0.6 | $561.47 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallon | $2.76 | 1 | $2.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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 subsidence. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit::** Foot

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $1,104.74

**Scenario Cost/Unit:** $36.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 0.6 | $3.83 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 1 | $61.96 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 2.5 | $78.13 |
| 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 Yard | $935.78 | 0.6 | $561.47 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallon | $2.76 | 1 | $2.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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 subsidence. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $888.89

**Scenario Cost/Unit:** $4.44

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 1 | $6.38 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 1 | $61.96 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1.5 | $46.88 |
| 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 Yard | $935.78 | 0.4 | $374.31 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallon | $2.76 | 1 | $2.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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 subsidence. Associated practices: 342 Critical Area Seeding

**Feature Measure:** Length of well casing

**Scenario Unit::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,260.82

**Scenario Cost/Unit:** $2.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 1 | $6.38 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 1 | $61.96 |
| **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. | Hour | $44.32 | 3 | $132.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 3 | $93.75 |
| 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 Yard | $935.78 | 0.7 | $655.05 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallon | $2.76 | 1 | $2.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 351 - Well Decommissioning

**Scenario** #5 - Handdug 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::** Foot

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $777.55

**Scenario Cost/Unit:** $31.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 1 | $6.38 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $22.95 | 20 | $459.00 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 4 | $125.00 |

**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:** 1.0

**Scenario Total Cost:** $55.77

**Scenario Cost/Unit:** $55.77

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. | Hour | $24.81 | 0.5 | $12.41 |
| **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 | $43.36 | 1 | $43.36 |

**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:** 1.0

**Scenario Total Cost:** $225.35

**Scenario Cost/Unit:** $225.35

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. | Hour | $24.81 | 0.5 | $12.41 |
| **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 | $43.36 | 1 | $43.36 |
| 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 | $169.58 | 1 | $169.58 |

**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:** 1.0

**Scenario Total Cost:** $274.80

**Scenario Cost/Unit:** $274.80

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. | Hour | $24.81 | 0.5 | $12.41 |
| **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 | $43.36 | 1 | $43.36 |
| 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 | $219.03 | 1 | $219.03 |

**Practice:** 356 - Dike

**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 inundation 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 management; 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 Yard

**Scenario Typical Size:** 4,500.0

**Scenario Total Cost:** $35,783.34

**Scenario Cost/Unit:** $7.95

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 Yard | $2.56 | 4500 | $11,520.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 4500 | $21,735.00 |
| **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. | Hour | $104.31 | 6 | $625.86 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 3 | $1,619.70 |

**Practice:** 356 - Dike

**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 inundation 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 management; 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 Yard

**Scenario Typical Size:** 4,500.0

**Scenario Total Cost:** $39,113.34

**Scenario Cost/Unit:** $8.69

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 Yard | $2.56 | 4500 | $11,520.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 4500 | $21,735.00 |
| 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 | $0.37 | 9000 | $3,330.00 |
| **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. | Hour | $104.31 | 6 | $625.86 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 3 | $1,619.70 |

**Practice:** 356 - Dike

**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 Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $18,348.66

**Scenario Cost/Unit:** $18.35

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 Yard | $4.83 | 1770 | $8,549.10 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 427 | $418.46 |
| 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 Yard | $4.38 | 1770 | $7,752.60 |
| **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. | Hour | $44.32 | 6 | $265.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**Practice:** 356 - Dike

**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 Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $13,348.36

**Scenario Cost/Unit:** $13.35

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 Yard | $4.83 | 1770 | $8,549.10 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 427 | $418.46 |
| 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 Yard | $1.86 | 1770 | $3,292.20 |
| **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. | Hour | $44.32 | 6 | $265.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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. 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), 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. Typical design size : Design Volume 439,440 ft3; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13'; 1' freeboard (not included in design volume)

**Feature Measure:** Design Storage Volume

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 439,440.0

**Scenario Total Cost:** $116,307.61

**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 Yard | $4.83 | 9102 | $43,962.66 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 8101 | $32,079.96 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 1389 | $1,361.22 |
| 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 Yard | $4.17 | 9125 | $38,051.25 |
| **Materials** | | | | | | |
| Structural steel tubing, 2" diameter | 1120 | Structural steel tubing, 2" diameter, 1/8" wall thickness, materials only | Foot | $3.73 | 8 | $29.84 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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 Foot

**Scenario Typical Size:** 3,580.0

**Scenario Total Cost:** $13,548.43

**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 Yard | $4.83 | 667 | $3,221.61 |
| 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. | Hour | $125.73 | 24 | $3,017.52 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallon | $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 Yard | $12.86 | 133 | $1,710.38 |
| 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 | $0.37 | 2660 | $984.20 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 63,851.0

**Scenario Total Cost:** $16,421.23

**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 Yard | $2.56 | 709 | $1,815.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 473 | $2,284.59 |
| 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. | Hour | $125.73 | 12 | $1,508.76 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallon | $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 Foot | $0.30 | 15963 | $4,788.90 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 63,851.0

**Scenario Total Cost:** $20,015.82

**Scenario Cost/Unit:** $0.31

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 Yard | $2.56 | 709 | $1,815.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 473 | $2,284.59 |
| 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. | Hour | $125.73 | 12 | $1,508.76 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallon | $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 Foot | $0.30 | 31925 | $9,577.50 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 63,851.0

**Scenario Total Cost:** $23,610.70

**Scenario Cost/Unit:** $0.37

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 Yard | $2.56 | 709 | $1,815.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 473 | $2,284.59 |
| 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. | Hour | $125.73 | 12 | $1,508.76 |
| Manure, compost, injection | 956 | Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs. | Gallon | $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 Foot | $0.30 | 47888 | $14,366.40 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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 Foot

**Scenario Typical Size:** 63,851.0

**Scenario Total Cost:** $26,922.81

**Scenario Cost/Unit:** $0.42

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 Yard | $2.56 | 709 | $1,815.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 473 | $2,284.59 |
| 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. | Hour | $125.73 | 12 | $1,508.76 |
| 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 Foot | $0.30 | 63851 | $19,155.30 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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 agricultural 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 agricultural waste.

**Feature Measure:** Length of Diversion

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $5,533.44

**Scenario Cost/Unit:** $5.53

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 Yard | $0.98 | 550 | $539.00 |
| 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 Yard | $4.17 | 1000 | $4,170.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.35 | $131.65 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.18 | $65.15 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.18 | $48.53 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 agricultural 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 agricultural waste.

**Feature Measure:** Length of Diversion

**Scenario Unit::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $1,424.33

**Scenario Cost/Unit:** $7.12

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 Yard | $0.98 | 110 | $107.80 |
| 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 Yard | $4.17 | 200 | $834.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.07 | $26.33 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.04 | $14.48 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.04 | $10.78 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 362 - Diversion

**Scenario** #3 - Diversion, Rebulid

**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 agricultural 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 agricultural waste.

**Feature Measure:** Linear feet of rebuilt diversion

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $3,951.60

**Scenario Cost/Unit:** $3.95

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 Yard | $0.98 | 250 | $245.00 |
| 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 Yard | $4.17 | 750 | $3,127.50 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #1 - Small Plug Flow <1000 AU

**Scenario Description:**

A plug flow anaerobic digester with less than 1000 animal unit capacity is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. 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 concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). 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: 910 animal units (650 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 910.0

**Scenario Total Cost:** $1,201,028.61

**Scenario Cost/Unit:** $1,319.81

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 | $63.92 | 2 | $127.84 |
| **Equipment Installation** | | | | | | |
| Plug Flow, Small (less than 1,000 animal units) | 2478 | Concrete plug flow 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 operat | Each | $1,200,000.00 | 1 | $1,200,000.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #2 - Medium Plug Flow 1000-2000 AU

**Scenario Description:**

A plug flow anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen on a livestock operation between 1,000 and 2,000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. 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 concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). 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: 1,750 animal units (1,250 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 1,750.0

**Scenario Total Cost:** $1,801,311.39

**Scenario Cost/Unit:** $1,029.32

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 | $63.92 | 2 | $127.84 |
| **Equipment Installation** | | | | | | |
| Plug Flow, Medium (between 1,000 and 2,000 animal units) | 2479 | Concrete plug flow 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 operat | Each | $1,800,000.00 | 1 | $1,800,000.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #3 - Large Plug Flow >2000 AU

**Scenario Description:**

A plug flow anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen on a livestock operation with more than 2,000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. 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 concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). 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: 3,920 animal units (2,800 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 3,920.0

**Scenario Total Cost:** $3,426,594.17

**Scenario Cost/Unit:** $874.13

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 | $63.92 | 2 | $127.84 |
| **Equipment Installation** | | | | | | |
| Plug Flow, Large (more than 2,000 animal units) | 2480 | Concrete plug flow 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 operat | Each | $3,425,000.00 | 1 | $3,425,000.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #4 - Small Complete Mix <1000 AU

**Scenario Description:**

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with less than 1000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. 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 round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). 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: 1,039 animal units (742 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 1,039.0

**Scenario Total Cost:** $745,689.64

**Scenario Cost/Unit:** $717.70

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 | $63.92 | 2 | $127.84 |
| **Equipment Installation** | | | | | | |
| Complete Mix, Small (less than 1,000 animal units) | 2481 | A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks, Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary | Each | $744,661.03 | 1 | $744,661.03 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #5 - Medium Complete Mix 1000-2500 AU

**Scenario Description:**

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with 1,000 to 2,500 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. 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 round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). 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: 1,890 animal units (1,350 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 1,890.0

**Scenario Total Cost:** $1,301,020.42

**Scenario Cost/Unit:** $688.37

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 | $63.92 | 2 | $127.84 |
| **Equipment Installation** | | | | | | |
| Complete Mix, Medium (between 1,000 and 2,500 animal units) | 2482 | A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks, Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary | Each | $1,299,709.03 | 1 | $1,299,709.03 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #6 - Large Complete Mix >2,500 AU

**Scenario Description:**

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with more than 2,500 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. 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 round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). 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: 3,220 animal units (2,300 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 3,220.0

**Scenario Total Cost:** $1,594.17

**Scenario Cost/Unit:** $0.50

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 | $63.92 | 2 | $127.84 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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:** 1,000.0

**Scenario Total Cost:** $108,424.79

**Scenario Cost/Unit:** $108.42

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Covered Lagoon (not including the lagoon or the associated cover) | 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 | $108,000.00 | 1 | $108,000.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #16 - Small Plug Flow less than 1000 AU

**Scenario Description:**

A plug flow 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 plug flow digester with less than 1,000 animal units. Selection of digester type will be based on effluent consistency. 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. A plug flow digester is typically constructed of concrete with vertical side walls and solid or flexible top. 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: 910 animal units (650 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 910.0

**Scenario Total Cost:** $1,201,028.61

**Scenario Cost/Unit:** $1,319.81

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 | $63.92 | 2 | $127.84 |
| **Equipment Installation** | | | | | | |
| Plug Flow, Small (less than 1,000 animal units) | 2478 | Concrete plug flow 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 operat | Each | $1,200,000.00 | 1 | $1,200,000.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**Practice:** 366 - Anaerobic Digester

**Scenario** #18 - Large Plug Flow greater than 2000 AU

**Scenario Description:**

A plug flow 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 plug flow digesters with more than 2,000 animal units. Selection of digester type will be based on effluent consistency. 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. A plug flow digester is typically constructed of concrete with vertical side walls and solid or flexible top. 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: 3,920 animal units (2,800 - 1,400 lbs dairy cows).

**Feature Measure:** Animals Units Contributing to Dige

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 3,920.0

**Scenario Total Cost:** $3,426,594.17

**Scenario Cost/Unit:** $874.13

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 | $63.92 | 2 | $127.84 |
| **Equipment Installation** | | | | | | |
| Plug Flow, Large (more than 2,000 animal units) | 2480 | Concrete plug flow 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 operat | Each | $3,425,000.00 | 1 | $3,425,000.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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 Foot

**Scenario Typical Size:** 1,600.0

**Scenario Total Cost:** $10,814.09

**Scenario Cost/Unit:** $6.76

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 Foot | $6.71 | 1600 | $10,736.00 |
| **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 | $78.09 | 1 | $78.09 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 1,600.0

**Scenario Total Cost:** $13,649.37

**Scenario Cost/Unit:** $8.53

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 Yard | $159.14 | 3 | $477.42 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 12 | $76.56 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 8 | $394.40 |
| Auger, Truck Mounted | 2049 | Truck mounted auger for large diameter excavation. Includes equipment and labor. | Hour | $393.34 | 4 | $1,573.36 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| **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 Foot | $6.71 | 1600 | $10,736.00 |
| **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 | $190.19 | 1 | $190.19 |

**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 storage 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 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 associated 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. Specified 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 Foot

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $42,738.96

**Scenario Cost/Unit:** $8.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Roof, Post Frame Building, 30' to 60' wide | 1676 | Post Frame Building, no sides, - 30' to 60' 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 | Square Foot | $8.46 | 5000 | $42,300.00 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 367 - Roofs and Covers

**Scenario** #5 - Timber Frame Roof, Hvy 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 storage 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 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 associated 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 Foot

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $55,438.96

**Scenario Cost/Unit:** $11.09

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Roof, Post Frame Building, 30' to 60' Wide, Hazardous Condtions | 2512 | Post Frame Building, no sides, - between 30' and 60' 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, s | Square Foot | $11.00 | 5000 | $55,000.00 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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. Specified 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 Foot

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $48,341.94

**Scenario Cost/Unit:** $9.67

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 Yard | $159.14 | 3 | $477.42 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 9 | $57.42 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 16 | $788.80 |
| Auger, Truck Mounted | 2049 | Truck mounted auger for large diameter excavation. Includes equipment and labor. | Hour | $393.34 | 8 | $3,146.72 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Roof, Post Frame Building, 30' to 60' wide | 1676 | Post Frame Building, no sides, - 30' to 60' 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 | Square Foot | $8.46 | 5000 | $42,300.00 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** 367 - Roofs and Covers

**Scenario** #7 - Timber Frame Roof, Complex found, Hvy 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:** Footprint of building

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $61,041.94

**Scenario Cost/Unit:** $12.21

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 Yard | $159.14 | 3 | $477.42 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 9 | $57.42 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 16 | $788.80 |
| Auger, Truck Mounted | 2049 | Truck mounted auger for large diameter excavation. Includes equipment and labor. | Hour | $393.34 | 8 | $3,146.72 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Roof, Post Frame Building, 30' to 60' Wide, Hazardous Condtions | 2512 | Post Frame Building, no sides, - between 30' and 60' 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, s | Square Foot | $11.00 | 5000 | $55,000.00 |
| **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 | $190.19 | 2 | $380.38 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 15,000.0

**Scenario Total Cost:** $127,262.28

**Scenario Cost/Unit:** $8.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 48 | $306.24 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 32 | $1,577.60 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 24 | $2,338.80 |
| Trencher, 8" | 936 | Equipment and power unit costs. Labor not included. | Hour | $99.31 | 8 | $794.48 |
| **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. | Hour | $44.32 | 24 | $1,063.68 |
| 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. | Hour | $24.81 | 48 | $1,190.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 24 | $604.32 |
| **Materials** | | | | | | |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $6.39 | 2170 | $13,866.30 |
| Covered Lagoon Gas Collection System | 1664 | Piping and collection system for biogas. Includes labor and equipment. | Each | $32,697.00 | 0.6 | $19,618.20 |
| Covered Lagoon Flare | 1666 | Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment. | Each | $85,462.82 | 1 | $85,462.82 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Foot

**Scenario Typical Size:** 50,000.0

**Scenario Total Cost:** $189,412.72

**Scenario Cost/Unit:** $3.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 90 | $574.20 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 56 | $2,760.80 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 40 | $3,898.00 |
| Trencher, 8" | 936 | Equipment and power unit costs. Labor not included. | Hour | $99.31 | 16 | $1,588.96 |
| **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. | Hour | $44.32 | 40 | $1,772.80 |
| 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. | Hour | $24.81 | 80 | $1,984.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 96 | $2,417.28 |
| **Materials** | | | | | | |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $6.39 | 7200 | $46,008.00 |
| Covered Lagoon Gas Collection System | 1664 | Piping and collection system for biogas. Includes labor and equipment. | Each | $32,697.00 | 1.3 | $42,506.10 |
| Covered Lagoon Flare | 1666 | Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment. | Each | $85,462.82 | 1 | $85,462.82 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 100,000.0

**Scenario Total Cost:** $357,144.76

**Scenario Cost/Unit:** $3.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 126 | $803.88 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 94 | $4,634.20 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 80 | $7,796.00 |
| Trencher, 8" | 936 | Equipment and power unit costs. Labor not included. | Hour | $99.31 | 24 | $2,383.44 |
| **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. | Hour | $44.32 | 80 | $3,545.60 |
| 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. | Hour | $24.81 | 160 | $3,969.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 208 | $5,237.44 |
| **Materials** | | | | | | |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $6.39 | 14400 | $92,016.00 |
| Covered Lagoon Gas Collection System | 1664 | Piping and collection system for biogas. Includes labor and equipment. | Each | $32,697.00 | 2 | $65,394.00 |
| Covered Lagoon Flare | 1666 | Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment. | Each | $85,462.82 | 2 | $170,925.64 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 auxiliary 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:** 30.0

**Scenario Total Cost:** $6,507.26

**Scenario Cost/Unit:** $216.91

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. | Hour | $44.32 | 8 | $354.56 |
| **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 | $205.09 | 30 | $6,152.70 |

**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 auxiliary 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:** 75.0

**Scenario Total Cost:** $16,054.12

**Scenario Cost/Unit:** $214.05

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. | Hour | $44.32 | 16 | $709.12 |
| **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 | $204.60 | 75 | $15,345.00 |

**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 auxiliary 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:** 150.0

**Scenario Total Cost:** $33,421.12

**Scenario Cost/Unit:** $222.81

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. | Hour | $44.32 | 16 | $709.12 |
| **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 | $218.08 | 150 | $32,712.00 |

**Practice:** 372 - Combustion System Improvement

**Scenario** #4 - IC Engine Repower, >=200 bhp

**Scenario Description:**

Older diesel engine replaced with new diesel engine repower (250 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 auxiliary engine providing a mechanical function for agricultural/forestry equipment.

**After Situation:**

The repowered diesel engine (350 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:** 250.0

**Scenario Total Cost:** $48,801.62

**Scenario Cost/Unit:** $195.21

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. | Hour | $44.32 | 16 | $709.12 |
| **Materials** | | | | | | |
| Motor, IC Engine, 200-299 HP | 1432 | Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 200 to 299 bhp. Materials only. | Horsepower | $192.37 | 250 | $48,092.50 |

**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:** 1.0

**Scenario Total Cost:** $1,618.77

**Scenario Cost/Unit:** $1,618.77

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. | Hour | $44.32 | 8 | $354.56 |
| **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 | $1,264.21 | 1 | $1,264.21 |

**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:** 1.0

**Scenario Total Cost:** $6,924.79

**Scenario Cost/Unit:** $6,924.79

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. | Hour | $44.32 | 12 | $531.84 |
| **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 | $6,392.95 | 1 | $6,392.95 |

**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:** 1.0

**Scenario Total Cost:** $8,695.10

**Scenario Cost/Unit:** $8,695.10

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. | Hour | $44.32 | 16 | $709.12 |
| **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 | $7,985.98 | 1 | $7,985.98 |

**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:** 1.0

**Scenario Total Cost:** $26,087.17

**Scenario Cost/Unit:** $26,087.17

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. | Hour | $44.32 | 40 | $1,772.80 |
| **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 | $24,314.37 | 1 | $24,314.37 |

**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:** 1.0

**Scenario Total Cost:** $51,604.80

**Scenario Cost/Unit:** $51,604.80

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. | Hour | $44.32 | 40 | $1,772.80 |
| **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 | $124.58 | 400 | $49,832.00 |

**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:** 1,760.0

**Scenario Total Cost:** $2,716.51

**Scenario Cost/Unit:** $1.54

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. | Acre | $6.78 | 132.7 | $899.71 |
| 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. | Hour | $181.68 | 10 | $1,816.80 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:** 1.0

**Scenario Total Cost:** $1,493.49

**Scenario Cost/Unit:** $1,493.49

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. | Hour | $44.32 | 3 | $132.96 |
| **Materials** | | | | | | |
| Fan, exhaust, 48" High Efficiency | 1187 | 48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only. | Each | $1,360.53 | 1 | $1,360.53 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:**

Inefficient 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:** 1.0

**Scenario Total Cost:** $246.20

**Scenario Cost/Unit:** $246.20

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. | Hour | $44.32 | 2 | $88.64 |
| **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 | $157.56 | 1 | $157.56 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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 bulk tank. Practice installation will be by a factory trained dairy technician and according manufacturer's specifications. After installation, energy is saved by a reduction in compressor 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:** 1.0

**Scenario Total Cost:** $5,292.18

**Scenario Cost/Unit:** $5,292.18

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. | Hour | $44.32 | 8 | $354.56 |
| **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 | $4,937.62 | 1 | $4,937.62 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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 compressor 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:** 1.0

**Scenario Total Cost:** $6,218.50

**Scenario Cost/Unit:** $6,218.50

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. | Hour | $44.32 | 8 | $354.56 |
| **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 | $5,863.94 | 1 | $5,863.94 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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 compressor 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:** 1.0

**Scenario Total Cost:** $7,195.28

**Scenario Cost/Unit:** $7,195.28

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. | Hour | $44.32 | 8 | $354.56 |
| **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 | $6,840.72 | 1 | $6,840.72 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:** 1.0

**Scenario Total Cost:** $4,400.83

**Scenario Cost/Unit:** $4,400.83

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. | Hour | $44.32 | 4 | $177.28 |
| **Materials** | | | | | | |
| Scroll Compressor - 5 HP | 1183 | Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only. | Each | $4,223.55 | 1 | $4,223.55 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #7 - Water Heater

**Scenario Description:**

Install an Efficient Propane 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:** 1.0

**Scenario Total Cost:** $3,465.02

**Scenario Cost/Unit:** $3,465.02

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. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $24.81 | 8 | $198.48 |
| **Materials** | | | | | | |
| Water Heater, High Efficiency | 2485 | Water heater with efficiency rating as per ASABE-S612. Includes materials and shipping only. | Each | $2,911.98 | 1 | $2,911.98 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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 separately 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:** 50.0

**Scenario Total Cost:** $12,534.06

**Scenario Cost/Unit:** $250.68

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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Variable Speed Drive, 50 HP | 1288 | Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only. | Horsepower | $243.59 | 50 | $12,179.50 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:** 1.0

**Scenario Total Cost:** $1,627.27

**Scenario Cost/Unit:** $1,627.27

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. | Hour | $44.32 | 8 | $354.56 |
| **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 | $655.75 | 1 | $655.75 |
| Switches and Controls, programmable controller | 1193 | Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems | Each | $167.45 | 1 | $167.45 |
| 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 | $449.51 | 1 | $449.51 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:** 1.0

**Scenario Total Cost:** $25,023.49

**Scenario Cost/Unit:** $25,023.49

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. | Hour | $44.32 | 16 | $709.12 |
| **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 | $24,314.37 | 1 | $24,314.37 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:** 1.0

**Scenario Total Cost:** $6,747.51

**Scenario Cost/Unit:** $6,747.51

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. | Hour | $44.32 | 8 | $354.56 |
| **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 | $6,392.95 | 1 | $6,392.95 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:** 1.0

**Scenario Total Cost:** $977.63

**Scenario Cost/Unit:** $977.63

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. | Hour | $44.32 | 4 | $177.28 |
| **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 | $800.35 | 1 | $800.35 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:** 1.0

**Scenario Total Cost:** $667.58

**Scenario Cost/Unit:** $667.58

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. | Hour | $44.32 | 4 | $177.28 |
| **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 | $490.30 | 1 | $490.30 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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 systems 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 congenital 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:** 6.0

**Scenario Total Cost:** $9,777.88

**Scenario Cost/Unit:** $1,629.65

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. | Hour | $44.32 | 16 | $709.12 |
| **Materials** | | | | | | |
| Heater, radiant tube | 1163 | Radiant tube heater rated at 125,000 BTU/hour. Materials only. | Each | $1,511.46 | 6 | $9,068.76 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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:** 750.0

**Scenario Total Cost:** $9,889.12

**Scenario Cost/Unit:** $13.19

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. | Hour | $44.32 | 16 | $709.12 |
| **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 | $12.24 | 750 | $9,180.00 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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 ventilation 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 circulated 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:** 14.0

**Scenario Total Cost:** $2,678.58

**Scenario Cost/Unit:** $191.33

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. | Hour | $44.32 | 24 | $1,063.68 |
| **Materials** | | | | | | |
| Inlet, Attic Ceiling | 2414 | Poultry house attic air inlets. Includes materials only. | Each | $115.35 | 14 | $1,614.90 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #17 - Grain Dryer

**Scenario Description:**

A replacement continuous dryer rated for an appropriately 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:** 860.0

**Scenario Total Cost:** $84,598.68

**Scenario Cost/Unit:** $98.37

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. | Hour | $44.32 | 16 | $709.12 |
| **Materials** | | | | | | |
| Grain dryer, Axial, 12' | 1158 | Grain dryer, 12 foot Axial with rated capacity of 460 bushels/hour. Materials only. | Bushel per Hour | $102.83 | 172 | $17,686.76 |
| Grain dryer, Axial, 16' | 1159 | Grain dryer, 16 foot Axial with rated capacity of 600 bushels/hour. Materials only. | Bushel per Hour | $88.78 | 172 | $15,270.16 |
| Grain dryer, Centrifugal, 20' | 1160 | Grain dryer, 20 foot Centrifugal with rated capacity of 785 bushels/hour. Materials only. | Bushel per Hour | $94.96 | 172 | $16,333.12 |
| Grain dryer, Centrifugal, 24' | 1161 | Grain dryer, 24 foot Centrifugal with rated capacity of 860 bushels/hr. Materials only. | Bushel per Hour | $101.70 | 172 | $17,492.40 |
| Grain dryer, Axial 28' | 1162 | Grain dryer, 28 foot Axial with rated capacity of 990 bushels/hr. Materials only. | Bushel per Hour | $99.46 | 172 | $17,107.12 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**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 inefficient 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 Foot

**Scenario Typical Size:** 150.0

**Scenario Total Cost:** $1,803.26

**Scenario Cost/Unit:** $12.02

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. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $24.81 | 2 | $49.62 |
| **Materials** | | | | | | |
| Tunnel doors | 2413 | Tunnel doors are used to replace curtains on tunnel inlets in a poultry house. Includes materials only. | Square Foot | $11.10 | 150 | $1,665.00 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #19 - RO<=200 GPH

**Scenario Description:**

Reverse osmosis (RO) unit is installed to concentrate the sugar content of sap prior to boiling to decrease boiling time and fuel use. RO units use a combination of electric high pressure pumps and membranes to concentrate the sap. Use for units rated at 200 GPH or less. Complete unit is added to operation with an existing evaporator to process sap before it enters the maple evaporator. Boiling time for concentrated sap is greatly reduced. Typical capacity of the RO unit is 125 GPH. Completion of an Agricultural Energy Management Plan AgEMP or equivalent energy audit identifies the energy savings with planned installation of the RO unit. Units are typically manufactured for maple applications. Associated Practices: AgEMP CAP 122

**Before Situation:**

1000 tap maple operation with a fuel oil fired evaporator running all sap through the evaporator and no existing RO. Sap is 1-2% sugar . All concentration is through evaporator with excessive boil time, fuel use, and emissions.

**After Situation:**

Sap is processed through RO before entering the evaporator. Sap is concentrated to 8% or more drastically reducing boil time, fuel consumption and emissions. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Capacity of RO

**Scenario Unit::** Gallon per Hour

**Scenario Typical Size:** 125.0

**Scenario Total Cost:** $4,459.37

**Scenario Cost/Unit:** $35.67

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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Reverse Osmosis unit, fixed cost portion | 2224 | Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Each | $1,669.81 | 1 | $1,669.81 |
| Reverse Osmosis unit, variable cost portion | 2225 | Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Gallon per Hour | $19.48 | 125 | $2,435.00 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #20 - RO>200-600 GPH

**Scenario Description:**

Reverse osmosis (RO) unit is installed to concentrate the sugar content of sap prior to boiling to decrease boiling time and fuel use. RO units use a combination of electric high pressure pumps and membranes to concentrate the sap. Use for units rated at greater than 200 GPH and less than or equal to 600 GPH. Complete unit is added to operation with an existing evaporator only to increase existing RO capacity to process sap before it enters the maple evaporator. Boiling time for concentrated sap is greatly reduced. Typical capacity is 600 GPH. Completion of an Agricultural Energy Management Plan AgEMP or equivalent energy audit identifies the energy savings with planned installation of the RO unit. Units are typically manufactured for maple applications. Associated Practices: AgEMP CAP 122

**Before Situation:**

3000 tap maple operation with a fuel oil fired evaporator running all sap through the evaporator and no existing RO. Sap is 1-2% sugar. All concentration is from combustion evaporation with excessive boil time, fuel use, and emissions.

**After Situation:**

Sap is processed through RO before entering the evaporator. Sap is concentrated to 8% or more drastically reducing boil time, fuel consumption, and emissions. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Capacity of RO

**Scenario Unit::** Gallon per Hour

**Scenario Typical Size:** 600.0

**Scenario Total Cost:** $14,066.93

**Scenario Cost/Unit:** $23.44

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. | Hour | $44.32 | 16 | $709.12 |
| **Materials** | | | | | | |
| Reverse Osmosis unit, fixed cost portion | 2224 | Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Each | $1,669.81 | 1 | $1,669.81 |
| Reverse Osmosis unit, variable cost portion | 2225 | Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Gallon per Hour | $19.48 | 600 | $11,688.00 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #21 - RO >600 GPH or add on

**Scenario Description:**

Reverse osmosis (RO) unit is installed to concentrate the sugar content of sap prior to boiling to decrease boiling time and fuel use. RO units use a combination of electric high pressure pumps and membranes to concentrate the sap. An add-on unit is added to an existing RO unit to increase existing RO capacity to process sap before it enters the maple evaporator or a large complete RO unit greater than 600 GPH is installed. Typical unit is 1200 GPH. Boiling time for concentrated sap is greatly reduced. Completion of an Agricultural Energy Management Plan AgEMP or equivalent energy audit identifies the energy savings with planned installation of the RO unit. Units are typically manufactured for maple applications. Associated Practices: AgEMP CAP 122

**Before Situation:**

5000 tap maple operation with a fuel oil fired evaporator running all sap through an existing RO that is under sized causing increased boil time, fuel consumption, and emissions.

**After Situation:**

Sap is processed through expanded RO before entering the evaporator. Sap is concentrated to 14% or more drastically reducing boil time, fuel consumption, and emissions. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Capacity of RO

**Scenario Unit::** Gallon per Hour

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $23,730.56

**Scenario Cost/Unit:** $19.78

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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Reverse Osmosis unit, variable cost portion | 2225 | Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only. | Gallon per Hour | $19.48 | 1200 | $23,376.00 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #22 - Enhanced preheater, small

**Scenario Description:**

The unit is installed 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. Use for units less than 40 sq ft. 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. 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:**

Existing evaporator uses cold sap at inflow causing long boil times. inefficient fuel use and increased emissions.

**After Situation:**

Use of a preheater captures waste heat from the evaporator and preheats cold sap and concentrates sap. Boil time, fuel use, and emissions are reduced. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Area of pan

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 24.0

**Scenario Total Cost:** $10,119.80

**Scenario Cost/Unit:** $421.66

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. | Hour | $44.32 | 4 | $177.28 |
| **Materials** | | | | | | |
| Sap Pre-Heater, High efficiency, fixed cost | 2254 | High efficiency sap pre-heater device, fixed cost portion. Materials only. | Each | $4,539.88 | 1 | $4,539.88 |
| Sap Pre-Heater, High efficiency, variable cost | 2255 | High efficiency sap pre-heater device, variable cost portion. Materials only. | Square Foot | $225.11 | 24 | $5,402.64 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #23 - Enhanced preheater, large

**Scenario Description:**

This unit is installed 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. Use for units 40 sq ft and larger. 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. 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:**

Existing evaporator uses cold sap at inflow causing long boil times. inefficient fuel use and increased emissions.

**After Situation:**

Use of a preheater captures waste heat from the evaporator and preheats cold sap and concentrates sap. Boil time, fuel use, and emissions are reduced. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Area of pan

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $9,358.96

**Scenario Cost/Unit:** $233.97

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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Sap Pre-Heater, High efficiency, variable cost | 2255 | High efficiency sap pre-heater device, variable cost portion. Materials only. | Square Foot | $225.11 | 40 | $9,004.40 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #24 - High Efficiency Pans for < 1000 taps

**Scenario Description:**

Install high efficiency pans to an existing 2.5 ft. by 8 ft. maple syrup evaporator. High efficiency pans have increased flue surface area and improved flue arrangement to increase boiling rate given the same overall rate of energy inputs. Specific equipment and resulting efficiencies need to be documented in an approved Agricultural Energy Management Plan (AgEMP). Installation needs to according to manufactures' recommendation and schematic. Installation needs to be provided by a Maple Equipment Technician and approved by a qualified Engineer. Associated Practices: CAP 122

**Before Situation:**

Existing maple operation has an existing maple syrup evaporator with documented inefficiencies from an approved AgEMP. Identified efficiency improvement is from pan replacement on an existing arch that is deemed efficient and can be retrofitted with new evaporator pans.

**After Situation:**

New pans are installed with increased flue surface area and or improved flue arrangements. Boiling rate is increased, boiling time and fuel use are decreased. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each High Efficiency Pan

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $4,707.20

**Scenario Cost/Unit:** $4,707.20

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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Maple Evaporator Pan (without Arch) < 1,000 Taps | 2405 | High efficiency evaporator pan for maple syrup production. Does not include the arch. Small operations, less than 1,000 taps. | Each | $4,352.64 | 1 | $4,352.64 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #25 - High Efficiency Pans >=1000 taps

**Scenario Description:**

Install high efficiency pans to an existing 4 ft. by 16 ft. maple syrup evaporator. High efficiency pans have increased flue surface area and improved flue arrangement to increase boiling rate given the same overall rate of energy inputs. Specific equipment and resulting efficiencies need to be documented in an approved Agricultural Energy Management Plan (AgEMP). Installation needs to according to manufactures' recommendation and schematic. Installation needs to be provided by a Maple Equipment Technician and approved by a qualified Engineer. Associated Practices: CAP 122

**Before Situation:**

Existing maple operation has an existing maple syrup evaporator with documented inefficiencies from an approved AgEMP. Identified efficiency improvement is from pan replacement on an existing arch that is deemed efficient and can be retrofitted with new evaporator pans.

**After Situation:**

New pans are installed with increased flue surface area and or improved flue arrangements. Boiling rate is increased, boiling time and fuel use are decreased. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each High Efficiency Pan

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $17,197.39

**Scenario Cost/Unit:** $17,197.39

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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Maple Evaporator Pan (without Arch) => 1,000 Taps | 2403 | High efficiency evaporator pan for maple syrup production. Does not include the arch. Large operations, greater than or equal to 1,000 taps. | Each | $16,842.83 | 1 | $16,842.83 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #26 - High Efficiency arch < 1000 taps

**Scenario Description:**

Install high efficiency 2.5 ft by 8 ft. combustion arch to provide combustion for evaporating maple sap. High efficiency arches use air injection, gasification technology, and/or increased insulation properties to increase energy efficiency by increasing boil rate and edits to reduce fuel use. Existing boiling pans are used or if new pans are specified in the AgEMP are installed under the appropriate scenario if available. Specific equipment and resulting efficiencies need to be documented in an approved Agricultural Energy Management Plan (AgEMP). Installation needs to according to manufacturer's recommendation and schematic. Installation needs to be provided by a Maple Equipment Technician and approved by a qualified Engineer. Associated Practices: CAP 122

**Before Situation:**

An older inefficient maple evaporator uses excessive amounts of energy to produce a given amount of maple syrup. An approved AgEMP identifies efficiency improvements by replacing the combustion arch with a newer energy efficient combustion arch unit.

**After Situation:**

A high efficiency arch is installed that will increase boil rate and decrease boil time and energy used. Existing boiling pans are used on the new arch or if replaced are cost shared under an appropriate scenario. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each Combustion Arch

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,280.41

**Scenario Cost/Unit:** $2,280.41

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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Maple Evaporator Combustion Arch without Pan < 1,000 Taps | 2406 | High efficiency evaporator combustion arch for maple syrup production. Does not include the pan. Small operations, less than 1,000 taps. | Each | $1,925.85 | 1 | $1,925.85 |

**Practice:** 374 - FARMSTEAD ENERGY IMPROVEMENT

**Scenario** #27 - High Efficiency arch >= 1000 taps

**Scenario Description:**

Install high efficiency 4 ft by 16 ft. combustion arch to provide combustion for evaporating maple sap. High efficiency arches use air injection, gasification technology, and/or increased insulation properties to increase energy efficiency by increasing boil rate and edits to reduce fuel use. Existing boiling pans are used or if new pans are specified in the AgEMP are installed under the appropriate scenario if available. Specific equipment and resulting efficiencies need to be documented in an approved Agricultural Energy Management Plan (AgEMP). Installation needs to according to manufacturer's recommendation and schematic. Installation needs to be provided by a Maple Equipment Technician and approved by a qualified Engineer. Associated Practices: CAP 122

**Before Situation:**

An older inefficient maple evaporator uses excessive amounts of energy to produce a given amount of maple syrup. An approved AgEMP identifies efficiency improvements by replacing the combustion arch with a newer energy efficient combustion arch unit.

**After Situation:**

A high efficiency arch is installed that will increase boil rate and decrease boil time and energy used. Existing boiling pans are used on the new arch or if replaced are cost shared under an appropriate scenario. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

**Feature Measure:** Each Combustion Arch

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $17,342.11

**Scenario Cost/Unit:** $17,342.11

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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Maple Evaporator Combustion Arch without Pan => 1,000 Taps | 2404 | High efficiency evaporator combustion arch for maple syrup production. Does not include the pan. Large operations, greater than or equal to 1,000 taps. | Each | $16,987.55 | 1 | $16,987.55 |

**Practice:** 378 - Pond

**Scenario** #1 - Excavated, all spoil

**Scenario Description:**

A low-hazard water impoundment structure is installed by excavating a pit 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. An earthen spillway is constructed as needed. 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 3,100 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 Yard

**Scenario Typical Size:** 3,100.0

**Scenario Total Cost:** $7,944.49

**Scenario Cost/Unit:** $2.56

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. | Hour | $137.09 | 40 | $5,483.60 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 40 | $1,577.20 |
| 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. | Hour | $49.27 | 5 | $246.35 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Yard

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $3,249.54

**Scenario Cost/Unit:** $4.06

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. | Hour | $137.09 | 8 | $1,096.72 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 8 | $779.60 |
| **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. | Hour | $44.32 | 16 | $709.12 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 378 - Pond

**Scenario** #3 - Embankment Pond without Pipe

**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 Yard

**Scenario Typical Size:** 3,100.0

**Scenario Total Cost:** $17,221.70

**Scenario Cost/Unit:** $5.56

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. | Hour | $137.09 | 40 | $5,483.60 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 40 | $3,898.00 |
| 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. | Hour | $61.27 | 40 | $2,450.80 |
| **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. | Hour | $24.81 | 40 | $992.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 80 | $3,154.40 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 378 - Pond

**Scenario** #4 - Embankment Pond with Pipe

**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 Yard

**Scenario Typical Size:** 3,100.0

**Scenario Total Cost:** $26,174.37

**Scenario Cost/Unit:** $8.44

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 Yard | $502.23 | 3 | $1,506.69 |
| 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 Yard | $2.56 | 1.6 | $4.10 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 48 | $6,580.32 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 48 | $4,677.60 |
| 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. | Hour | $61.27 | 48 | $2,940.96 |
| **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. | Hour | $44.32 | 48 | $2,127.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 96 | $3,785.28 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 19.6 | $604.46 |
| 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 | $2.47 | 118 | $291.46 |
| Pipe, CMP, 30", 16 Gauge | 1742 | 30" Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only. | Foot | $29.37 | 8 | $234.96 |
| Pipe, CMP, 18", 16 Gauge | 1743 | 18" Corrugated Metal Pipe, Galvanized, Uncoated, 16 gage. Material cost only. | Foot | $18.35 | 98 | $1,798.30 |
| **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 | $190.19 | 2 | $380.38 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $683.00

**Scenario Cost/Unit:** $1.37

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| 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. | Hour | $12.04 | 2 | $24.08 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 63 | $38.43 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 63 | $322.56 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 63 | $98.91 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 30 | $2.70 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $292.31

**Scenario Cost/Unit:** $0.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 3 | $72.24 |
| 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. | Hour | $12.04 | 6 | $72.24 |
| **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. | Hour | $24.81 | 1 | $24.81 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Tree, conifer, seedling, bare root, 3-0 | 1515 | Bare root conifer trees, 3-0 (3 years old). Includes materials and shipping only. | Each | $0.36 | 63 | $22.68 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 20 | $1.80 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $504.25

**Scenario Cost/Unit:** $1.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 2 | $54.76 |
| 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. | Hour | $6.84 | 2 | $13.68 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 6-18" | 1509 | Bare root hardwood trees 6-18" tall. Includes materials and shipping only. | Each | $0.67 | 125 | $83.75 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 60 | $5.40 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $489.25

**Scenario Cost/Unit:** $0.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 2 | $54.76 |
| 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. | Hour | $6.84 | 2 | $13.68 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Tree, conifer, seedling, containerized, 10 cu. in. | 1519 | Containerized conifer stock, 10 cubic inches (approx 6" plug), 1.7" x 6"). Includes materials and shipping only. | Each | $0.55 | 125 | $68.75 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 60 | $5.40 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $732.58

**Scenario Cost/Unit:** $1.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 3 | $72.24 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 3 | $82.14 |
| 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. | Hour | $6.84 | 3 | $20.52 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 3 | $75.54 |
| 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. | Hour | $49.27 | 3 | $147.81 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 6-18" | 1509 | Bare root hardwood trees 6-18" tall. Includes materials and shipping only. | Each | $0.67 | 190 | $127.30 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 95 | $8.55 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $590.08

**Scenario Cost/Unit:** $1.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 3 | $72.24 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 3 | $82.14 |
| 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. | Hour | $6.84 | 3 | $20.52 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 6-18" | 1509 | Bare root hardwood trees 6-18" tall. Includes materials and shipping only. | Each | $0.67 | 63 | $42.21 |
| Tree, conifer, seedling, containerized, 10 cu. in. | 1519 | Containerized conifer stock, 10 cubic inches (approx 6" plug), 1.7" x 6"). Includes materials and shipping only. | Each | $0.55 | 125 | $68.75 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 80 | $7.20 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**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:** 248.0

**Scenario Total Cost:** $3,274.14

**Scenario Cost/Unit:** $13.20

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. | Hour | $12.04 | 12 | $144.48 |
| **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. | Hour | $24.81 | 24 | $595.44 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal. | 1532 | Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only. | Each | $7.15 | 83 | $593.45 |
| Tree, conifer, seedling or transplant, potted or B&B, 2-3 gal. | 1537 | Potted or balled and burlapped conifer tree, 2-3 gal. Includes materials and shipping only. | Each | $6.97 | 165 | $1,150.05 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 248 | $389.36 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 80 | $7.20 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario** #9 - Multi-row Tree/shrub, containerized stock

**Scenario Description:**

A multi-row linear planting of trees and/or 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 16' centers. Second row is 30-36" shrubs planted on 5-7' centers. 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. 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 such as those prone to intense wildlife pressure.

**After Situation:**

A multi-row linear planting of trees and/or 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::** Foot

**Scenario Typical Size:** 1,980.0

**Scenario Total Cost:** $7,179.56

**Scenario Cost/Unit:** $3.63

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. | Hour | $24.81 | 51.6 | $1,280.20 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, potted or B&B, 2-3 gal. | 1527 | Potted or balled and burlapped shrub, 2-3 gal. Includes materials and shipping only. | Each | $8.97 | 330 | $2,960.10 |
| Tree, hardwood, seedling or transplant, potted or B&B, 5 gal. | 1533 | Potted or balled and burlapped hardwood tree, 5 gal. Includes materials and shipping only. | Each | $14.69 | 124 | $1,821.56 |
| Tree shelter, solid tube type, 5" x 48" | 1571 | 5" x 48" tree tube for protection from animal damage. Materials only. | Each | $2.11 | 454 | $957.94 |
| Stakes, wood, 1" x 2" x 24" | 1579 | 1" x 2" x 24" wood stakes to fasten items in place. Includes materials only. | Each | $0.34 | 454 | $154.36 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 60 | $5.40 |

**Practice:** 380 - Windbreak/Shelterbelt Establishment

**Scenario** #10 - Single row of tree and shrub planting with tree tublings

**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::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $416.12

**Scenario Cost/Unit:** $2.08

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. | Hour | $12.04 | 5 | $60.20 |
| **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. | Hour | $24.81 | 5 | $124.05 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Tree, conifer, seedling or transplant, potted, 1 qt. | 1534 | Potted conifer tree, 1 quart. Includes materials and shipping only. | Each | $2.44 | 20 | $48.80 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 20 | $102.40 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 20 | $31.40 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $3,932.92

**Scenario Cost/Unit:** $1.97

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. | Hour | $8.08 | 14 | $113.12 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 5 | $120.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 14 | $383.32 |
| **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. | Hour | $24.81 | 36 | $893.16 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 14 | $352.52 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $71.19 | 6 | $427.14 |
| Post, Wood, CCA treated, 4" x 8' | 10 | Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only. | Each | $8.06 | 38 | $306.28 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 44 | $664.40 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Foot | $0.17 | 2000 | $340.00 |
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 2 | $332.58 |

**Practice:** 382 - Fence

**Scenario** #2 - Woven Wire

**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::** Foot

**Scenario Typical Size:** 2,640.0

**Scenario Total Cost:** $8,868.95

**Scenario Cost/Unit:** $3.36

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. | Hour | $8.08 | 35 | $282.80 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 5 | $120.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 35 | $958.30 |
| **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. | Hour | $24.81 | 76 | $1,885.56 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 35 | $881.30 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $71.19 | 2 | $142.38 |
| Wire, Woven, Galvanized, 12.5 Gauge, 48" | 4 | Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only. | Each | $257.12 | 8 | $2,056.96 |
| Post, Wood, CCA treated, 4" x 8' | 10 | Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only. | Each | $8.06 | 168 | $1,354.08 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 44 | $664.40 |
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 2 | $332.58 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $3,245.49

**Scenario Cost/Unit:** $1.62

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. | Hour | $8.08 | 9.5 | $76.76 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 9.5 | $260.11 |
| **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. | Hour | $24.81 | 28 | $694.68 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 9.5 | $239.21 |
| **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 | $114.08 | 1 | $114.08 |
| Post, Wood, CCA treated, 3-4" x 7' | 9 | Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only. | Each | $6.26 | 25 | $156.50 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 32 | $483.20 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $10.51 | 7 | $73.57 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $1.81 | 7 | $12.67 |
| Electric, Lightening Diverter | 22 | Electric, Lightening diverter for electric fence. Includes materials and shipping only. | Each | $10.27 | 1 | $10.27 |
| Electric, Insulated cable | 23 | Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only. | Each | $29.98 | 1 | $29.98 |
| Electric, Power Surge Protector | 24 | Electric, Power Surge Protector for electric fence. Includes materials and shipping only. | Each | $9.64 | 1 | $9.64 |
| Electric, Cutoff Switch | 25 | Electric, Cutoff Switch for electric fence. Includes materials and shipping only. | Each | $8.53 | 1 | $8.53 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $41.14 | 1 | $41.14 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $324.22 | 1 | $324.22 |
| 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. | Foot | $0.07 | 2000 | $140.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 2 | $332.58 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $4,132.35

**Scenario Cost/Unit:** $2.07

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. | Hour | $8.08 | 13.5 | $109.08 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 13.5 | $369.63 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 13.5 | $339.93 |
| **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 | $114.08 | 2 | $228.16 |
| Post, Wood, CCA treated, 4" x 8' | 10 | Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only. | Each | $8.06 | 38 | $306.28 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 44 | $664.40 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $10.51 | 7 | $73.57 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $1.81 | 7 | $12.67 |
| Electric, Lightening Diverter | 22 | Electric, Lightening diverter for electric fence. Includes materials and shipping only. | Each | $10.27 | 1 | $10.27 |
| Electric, Insulated cable | 23 | Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only. | Each | $29.98 | 1 | $29.98 |
| Electric, Power Surge Protector | 24 | Electric, Power Surge Protector for electric fence. Includes materials and shipping only. | Each | $9.64 | 1 | $9.64 |
| Electric, Cutoff Switch | 25 | Electric, Cutoff Switch for electric fence. Includes materials and shipping only. | Each | $8.53 | 1 | $8.53 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $41.14 | 1 | $41.14 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $324.22 | 1 | $324.22 |
| 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. | Foot | $0.12 | 2000 | $240.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 2 | $332.58 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $5,232.77

**Scenario Cost/Unit:** $2.62

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. | Hour | $8.08 | 19 | $153.52 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 19 | $520.22 |
| 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. | Foot | $0.18 | 2000 | $360.00 |
| **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. | Hour | $24.81 | 34 | $843.54 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 19 | $478.42 |
| **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 | $114.08 | 3 | $342.24 |
| Post, Wood, CCA treated, 4" x 8' | 10 | Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only. | Each | $8.06 | 38 | $306.28 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 76 | $1,147.60 |
| Electric, Ground Rods | 20 | Electric, Ground Rod for electric fence. Includes materials and shipping only. | Each | $10.51 | 7 | $73.57 |
| Electric, Ground Rod Clamps | 21 | Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only. | Each | $1.81 | 7 | $12.67 |
| Electric, Lightening Diverter | 22 | Electric, Lightening diverter for electric fence. Includes materials and shipping only. | Each | $10.27 | 1 | $10.27 |
| Electric, Insulated cable | 23 | Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only. | Each | $29.98 | 1 | $29.98 |
| Electric, Power Surge Protector | 24 | Electric, Power Surge Protector for electric fence. Includes materials and shipping only. | Each | $9.64 | 1 | $9.64 |
| Electric, Cutoff Switch | 25 | Electric, Cutoff Switch for electric fence. Includes materials and shipping only. | Each | $8.53 | 1 | $8.53 |
| Electric, Tester | 26 | Electric, Tester for electric fence. Includes materials and shipping only. | Each | $41.14 | 1 | $41.14 |
| Electric, Energizer, 6 joule | 29 | Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only. | Each | $324.22 | 1 | $324.22 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 2 | $332.58 |
| **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 | $190.19 | 1 | $190.19 |

**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::** Foot

**Scenario Typical Size:** 450.0

**Scenario Total Cost:** $2,192.52

**Scenario Cost/Unit:** $4.87

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. | Hour | $8.08 | 9 | $72.72 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 9 | $246.42 |
| 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. | Foot | $0.18 | 450 | $81.00 |
| **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. | Hour | $24.81 | 14 | $347.34 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 9 | $226.62 |
| **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 | $114.08 | 1 | $114.08 |
| Post, Wood, CCA treated, 4" x 8' | 10 | Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only. | Each | $8.06 | 10 | $80.60 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 41 | $619.10 |
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 1 | $166.29 |
| **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 | $190.19 | 1 | $190.19 |

**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::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $3,166.70

**Scenario Cost/Unit:** $15.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Fence, Chain Link | 1079 | Fence, Chain Link, 5' High, 9 ga Wire, Posts in Concrete on 10' Centers. Includes all materials, equipment and labor. | Foot | $14.95 | 182 | $2,720.90 |
| Gate, Chain Link, 18', Slide Gate | 1081 | Chain Link Gate, 18 ' Wide X 5' Tall, Installed in Concrete | Each | $149.89 | 1 | $149.89 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 3,600.0

**Scenario Total Cost:** $7,337.82

**Scenario Cost/Unit:** $2.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Wire, Woven, Wildlife, 96" | 6 | High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only. | Each | $455.40 | 11 | $5,009.40 |
| Post, Wood, CCA treated, 6" x 12-14' | 13 | Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only. | Each | $26.98 | 6 | $161.88 |
| Post, Steel T, 1.33 lbs, 10' | 17 | Steel Post, Studded 10' - 1.33 lb. Includes materials and shipping only. | Each | $10.93 | 100 | $1,093.00 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Foot | $0.12 | 3600 | $432.00 |
| Property/Safety Signs | 293 | Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5" x 4.75". Includes materials and shipping only. | Each | $1.53 | 35 | $53.55 |
| Gate, Game, 8' High X 4' | 1082 | 4' Wide Game Gate (8' Tall). Includes materials and shipping only. | Each | $202.24 | 1 | $202.24 |
| **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 | $190.19 | 1 | $190.19 |

**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::** Foot

**Scenario Typical Size:** 3,614.0

**Scenario Total Cost:** $15,434.20

**Scenario Cost/Unit:** $4.27

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. | Hour | $8.08 | 30 | $242.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 30 | $821.40 |
| Fence, Wire Assembly, Woven Wire, Game Fence | 1088 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Foot | $0.24 | 3600 | $864.00 |
| **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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 30 | $755.40 |
| **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 | $114.08 | 2 | $228.16 |
| Wire, Woven, Wildlife, 96" | 6 | High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only. | Each | $455.40 | 11 | $5,009.40 |
| Post, Wood, CCA treated, 6" x 12-14' | 13 | Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only. | Each | $26.98 | 200 | $5,396.00 |
| Property/Safety Signs | 293 | Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5" x 4.75". Includes materials and shipping only. | Each | $1.53 | 35 | $53.55 |
| Gate, Game, 8' High X 14' | 1085 | 14' Wide Game Gate (8' Tall). Includes materials and shipping only. | Each | $385.10 | 1 | $385.10 |
| **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 | $190.19 | 1 | $190.19 |

**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 significantly 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::** Acre

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $7,031.05

**Scenario Cost/Unit:** $1,757.76

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. | Hour | $137.09 | 10 | $1,370.90 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 80 | $386.40 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 8 | $459.04 |
| 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. | Hour | $71.74 | 8 | $573.92 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 8 | $39.52 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 8 | $66.56 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 10 | $394.30 |
| 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. | Hour | $49.27 | 12 | $591.24 |
| **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. | Acre | $6.96 | 4 | $27.84 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 4 | $169.48 |
| **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 i | Dollar | $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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $10,739.77

**Scenario Cost/Unit:** $2,684.94

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. | Hour | $137.09 | 10 | $1,370.90 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 160 | $772.80 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 10 | $240.80 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | $84.38 | 10 | $843.80 |
| 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. | Hour | $71.74 | 14 | $1,004.36 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 14 | $69.16 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 8 | $66.56 |
| **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. | Hour | $24.81 | 160 | $3,969.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 10 | $251.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 10 | $394.30 |
| 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. | Hour | $49.27 | 20 | $985.40 |
| **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. | Acre | $6.96 | 4 | $27.84 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 4 | $169.48 |
| **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 i | Dollar | $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 | $190.19 | 1 | $190.19 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Acre

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $6,271.65

**Scenario Cost/Unit:** $1,567.91

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 60 | $289.80 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 5 | $286.90 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | $84.38 | 16 | $1,350.08 |
| 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. | Hour | $71.74 | 8 | $573.92 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 8 | $39.52 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 8 | $66.56 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 5 | $125.90 |
| 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. | Hour | $49.27 | 12 | $591.24 |
| **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. | Acre | $6.96 | 4 | $27.84 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 4 | $169.48 |
| **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 i | Dollar | $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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 383 - Fuel Break

**Scenario** #4 - Masticator, Steel Slope

**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::** Acre

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $8,973.93

**Scenario Cost/Unit:** $2,243.48

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 120 | $579.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 12 | $288.96 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | $84.38 | 20 | $1,687.60 |
| 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. | Hour | $71.74 | 12 | $860.88 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 14 | $69.16 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 7 | $58.24 |
| **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. | Hour | $24.81 | 120 | $2,977.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 12 | $302.16 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 20 | $788.60 |
| 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. | Hour | $49.27 | 12 | $591.24 |
| **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. | Acre | $6.96 | 4 | $27.84 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 4 | $169.48 |
| **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 i | Dollar | $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 | $190.19 | 1 | $190.19 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Acre

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $8,171.04

**Scenario Cost/Unit:** $2,042.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 240 | $1,159.20 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 12 | $288.96 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 10 | $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. | Hour | $24.81 | 240 | $5,954.40 |
| 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. | Hour | $49.27 | 12 | $591.24 |
| **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. | Acre | $6.96 | 4 | $27.84 |
| **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 i | Dollar | $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::** Acre

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $1,144.77

**Scenario Cost/Unit:** $286.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 8 | $459.04 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **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 | $190.19 | 1 | $190.19 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $5,527.86

**Scenario Cost/Unit:** $276.39

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. | Hour | $49.30 | 16 | $788.80 |
| Brush Chipper, 6" capacity | 938 | Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hour | $23.48 | 16 | $375.68 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 16 | $1,017.92 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 48 | $1,208.64 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $18,039.16

**Scenario Cost/Unit:** $901.96

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 40 | $3,898.00 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 80 | $386.40 |
| Log skidder | 942 | Equipment and power unit costs. Labor not included. | Hour | $140.95 | 40 | $5,638.00 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 40 | $2,544.80 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 120 | $3,021.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 384 - Woody Residue Treatment

**Scenario** #3 - Sivicultural 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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $8,319.58

**Scenario Cost/Unit:** $207.99

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 120 | $579.60 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | $84.38 | 40 | $3,375.20 |
| **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. | Hour | $24.81 | 120 | $2,977.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 40 | $1,007.20 |
| **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 | $190.19 | 2 | $380.38 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $7,028.64

**Scenario Cost/Unit:** $351.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 40 | $193.20 |
| Brush Chipper, 6" capacity | 938 | Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hour | $23.48 | 30 | $704.40 |
| Log skidder | 942 | Equipment and power unit costs. Labor not included. | Hour | $140.95 | 10 | $1,409.50 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 20 | $1,272.40 |
| **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. | Hour | $24.81 | 40 | $992.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 60 | $1,510.80 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $13,037.48

**Scenario Cost/Unit:** $325.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 40 | $193.20 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 40 | $963.20 |
| 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. | Acre | $176.48 | 40 | $7,059.20 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 80 | $2,014.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $129.63

**Scenario Cost/Unit:** $129.63

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. | Acre | $12.32 | 3 | $36.96 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Materials** | | | | | | |
| Untreated Conventional Seed, One Species, Warm Season, Native Perennial Grass | 2341 | Untreated conventional native, warm season perennial grass. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $69.06 | 1 | $69.06 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $95.59

**Scenario Cost/Unit:** $95.59

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. | Acre | $12.32 | 1 | $12.32 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 20 | $12.80 |
| One Species, Cool Season, Introduced Perennial Grass | 2313 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $31.86 | 1 | $31.86 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $187.02

**Scenario Cost/Unit:** $187.02

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. | Acre | $12.32 | 3 | $36.96 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Materials** | | | | | | |
| Untreated Conventional Seed, Pollinator Mix, Perennial Grass and Forb Mix | 2503 | Untreated conventional grass and legume pollinator mix. Includes material and shipping only. | Acre | $126.45 | 1 | $126.45 |

**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 intermittent flooding and saturated soils where the existing 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 Management (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 concern(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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,900.86

**Scenario Cost/Unit:** $1,900.86

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. | Acre | $12.32 | 1 | $12.32 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 2 | $127.56 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.5 | $188.08 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.25 | $90.49 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.25 | $67.41 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| **Materials** | | | | | | |
| Six Species Mix, Native Forb | 2334 | Native forb mix. Includes material and shipping only. | Acre | $960.66 | 1 | $960.66 |
| **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 | $190.19 | 2 | $380.38 |

**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 intermittent flooding and saturated soils where the existing 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 Management (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 concern(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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,696.42

**Scenario Cost/Unit:** $1,696.42

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. | Acre | $12.32 | 1 | $12.32 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 2 | $127.56 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 8.5 | $141.53 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| **Materials** | | | | | | |
| Six Species Mix, Native Forb | 2334 | Native forb mix. Includes material and shipping only. | Acre | $960.66 | 1 | $960.66 |
| **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 | $190.19 | 2 | $380.38 |

**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::** Acre

**Scenario Typical Size:** 3.0

**Scenario Total Cost:** $11,974.37

**Scenario Cost/Unit:** $3,991.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| 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. | Hour | $7.12 | 8 | $56.96 |
| 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. | Hour | $12.04 | 8 | $96.32 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 1.5 | $564.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.75 | $271.48 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.75 | $202.22 |
| **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. | Hour | $24.81 | 27 | $669.87 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 1305 | $796.05 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 1305 | $6,681.60 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 1305 | $2,048.85 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 3.0

**Scenario Total Cost:** $12,227.07

**Scenario Cost/Unit:** $4,075.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8.8 | $211.90 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 8.8 | $240.94 |
| 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. | Hour | $17.58 | 5.6 | $98.45 |
| 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. | Hour | $6.84 | 5.6 | $38.30 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 1.5 | $564.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.75 | $271.48 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.75 | $202.22 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 5.6 | $141.01 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 7 | $344.89 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 1305 | $796.05 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 1305 | $6,681.60 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 1305 | $2,048.85 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 3.0

**Scenario Total Cost:** $10,259.26

**Scenario Cost/Unit:** $3,419.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 12 | $288.96 |
| 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. | Hour | $7.12 | 12 | $85.44 |
| 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. | Hour | $12.04 | 12 | $144.48 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 1.5 | $564.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.75 | $271.48 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.75 | $202.22 |
| **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. | Hour | $24.81 | 74 | $1,835.94 |
| 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. | Hour | $49.27 | 12 | $591.24 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, potted, 1 qt. | 1524 | Potted shrub, 1 quart. Includes materials and shipping only. | Each | $2.52 | 909 | $2,290.68 |
| Tree, hardwood, seedling or transplant, potted, 1 qt. | 1529 | Potted hardwood tree, 1 quart. Includes materials and shipping only. | Each | $2.47 | 435 | $1,074.45 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 435 | $2,227.20 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 435 | $682.95 |

**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 environmental 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,576.70

**Scenario Cost/Unit:** $6,576.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 12 | $375.12 |
| 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. | Hour | $7.12 | 12 | $85.44 |
| 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. | Hour | $17.58 | 12 | $210.96 |
| 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. | Hour | $12.04 | 65 | $782.60 |
| 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. | Hour | $2.68 | 4 | $10.72 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 1.5 | $564.23 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.75 | $271.48 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.75 | $202.22 |
| **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. | Hour | $24.81 | 64 | $1,587.84 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, potted, 1/2 to 1 gal. | 1526 | Potted shrub, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.52 | 150 | $678.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal. | 1532 | Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only. | Each | $7.15 | 50 | $357.50 |
| **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 | $78.09 | 1 | $78.09 |
| 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 | $190.19 | 1 | $190.19 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $176.52

**Scenario Cost/Unit:** $176.52

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. | Acre | $12.32 | 3 | $36.96 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 1.5 | $46.89 |
| **Materials** | | | | | | |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 1 | $69.06 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $190.91

**Scenario Cost/Unit:** $190.91

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. | Acre | $12.32 | 3 | $36.96 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 1.5 | $46.89 |
| **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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 20 | $12.80 |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 1 | $48.34 |

**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::** Foot

**Scenario Typical Size:** 4,000.0

**Scenario Total Cost:** $159.12

**Scenario Cost/Unit:** $0.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 2 | $24.64 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 2 | $36.70 |
| **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. | Hour | $24.81 | 2 | $49.62 |

**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::** Foot

**Scenario Typical Size:** 3,000.0

**Scenario Total Cost:** $1,759.90

**Scenario Cost/Unit:** $0.59

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. | Hour | $73.10 | 4 | $292.40 |
| 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. | Foot | $3.16 | 325 | $1,027.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $1,680.90

**Scenario Cost/Unit:** $1.68

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. | Hour | $73.10 | 4 | $292.40 |
| 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. | Foot | $3.16 | 300 | $948.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 3,000.0

**Scenario Total Cost:** $922.13

**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. | Hour | $57.38 | 4 | $229.52 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 2 | $24.64 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 4 | $73.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $11.75 | 1 | $11.75 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 8 | $198.48 |
| **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 | $0.64 | 70 | $44.80 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 70 | $25.20 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 1 | $93.23 |
| **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 | $190.19 | 1 | $190.19 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $4,347.30

**Scenario Cost/Unit:** $4.35

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. | Hour | $73.10 | 8 | $584.80 |
| 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. | Hour | $55.36 | 4 | $221.44 |
| 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. | Foot | $3.16 | 800 | $2,528.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **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 | $539.90 | 1 | $539.90 |

## USDA - Natural Resources Conservation Service

**New York**

**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 designing 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::** Foot

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $10,407.88

**Scenario Cost/Unit:** $34.69

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. | Hour | $125.73 | 8 | $1,005.84 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| **Materials** | | | | | | |
| Cuttings, woody, large size | 1309 | Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only. | Each | $17.90 | 300 | $5,370.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 25 | $858.00 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $8.91 | 10 | $89.10 |
| One Species, Native Forb, Moderate/High Cost | 2331 | Native forb. Includes material and shipping only. | Acre | $641.01 | 0.1 | $64.10 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 and/or 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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $22,814.13

**Scenario Cost/Unit:** $11,407.07

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. | Hour | $61.96 | 16 | $991.36 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 8 | $584.80 |
| **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. | Hour | $44.32 | 160 | $7,091.20 |
| 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. | Hour | $24.81 | 40 | $992.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |
| 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. | Hour | $104.31 | 40 | $4,172.40 |
| **Materials** | | | | | | |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $43.27 | 1 | $43.27 |
| Cuttings, woody, large size | 1309 | Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only. | Each | $17.90 | 200 | $3,580.00 |
| Tree, willow | 1426 | Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only. | Each | $0.65 | 200 | $130.00 |
| Tree shelter, wire mesh | 1557 | 5 feet tall, Woven Wire mesh, 6"x 6" opening or smaller, 10 gauge wire (minimum) , cage placed around seedling for animal protection. Materials only. | Each | $2.32 | 200 | $464.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| One Species, Native Forb, Moderate/High Cost | 2331 | Native forb. Includes material and shipping only. | Acre | $641.01 | 2 | $1,282.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $22,198.68

**Scenario Cost/Unit:** $22,198.68

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. | Hour | $181.78 | 16 | $2,908.48 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 8 | $855.28 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 20 | $616.80 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 30 | $937.50 |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $43.27 | 1 | $43.27 |
| Cuttings, woody, large size | 1309 | Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only. | Each | $17.90 | 300 | $5,370.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 40 | $1,372.80 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.55 | 50 | $27.50 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 15 | $393.15 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $227.38 | 30 | $6,821.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $8.91 | 20 | $178.20 |
| **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 | $539.90 | 1 | $539.90 |

**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 biologist 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $14,695.54

**Scenario Cost/Unit:** $14,695.54

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. | Hour | $181.78 | 16 | $2,908.48 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 8 | $855.28 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 30 | $925.20 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 120 | $3,750.00 |
| Cuttings, woody, large size | 1309 | Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only. | Each | $17.90 | 100 | $1,790.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 60 | $2,059.20 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 20 | $524.20 |
| **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 | $539.90 | 1 | $539.90 |

**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 scenario 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 bank full width

**Scenario Unit::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $36,994.86

**Scenario Cost/Unit:** $36,994.86

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. | Hour | $181.78 | 16 | $2,908.48 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 8 | $855.28 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 60 | $2,659.20 |
| 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. | Hour | $24.81 | 24 | $595.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 180 | $8,868.60 |
| 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. | Hour | $104.31 | 32 | $3,337.92 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 17 | $524.28 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 60 | $1,875.00 |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $43.27 | 1 | $43.27 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Cuttings, woody, large size | 1309 | Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only. | Each | $17.90 | 300 | $5,370.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 40 | $1,372.80 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.55 | 8 | $4.40 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 7 | $183.47 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $227.38 | 30 | $6,821.40 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $8.91 | 10 | $89.10 |
| **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 | $539.90 | 1 | $539.90 |

**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:** 1.0

**Scenario Total Cost:** $1,250.35

**Scenario Cost/Unit:** $1,250.35

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. | Hour | $125.73 | 1 | $125.73 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 1 | $4.83 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 1 | $63.62 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 2 | $78.86 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Dimension Lumber, untreated | 1045 | Untreated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners. | Board Foot | $0.82 | 100 | $82.00 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 4 | $146.84 |
| 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 | $1.30 | 14 | $18.20 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 2 | $68.64 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $227.38 | 2 | $454.76 |
| **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 | $539.90 | 0.2 | $107.98 |

**Practice:** 395 - Stream Habitat Improvement and Management

**Scenario** #8 - Mdstream 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 scenario 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 boulders in 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:** 1.0

**Scenario Total Cost:** $946.51

**Scenario Cost/Unit:** $946.51

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. | Hour | $125.73 | 1 | $125.73 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 2 | $9.66 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 0.5 | $31.81 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 1.5 | $59.15 |
| **Materials** | | | | | | |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 2.5 | $85.80 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.55 | 40 | $22.00 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $227.38 | 2 | $454.76 |
| **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 | $539.90 | 0.2 | $107.98 |

**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 scenario 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 deflectors, 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:** 1.0

**Scenario Total Cost:** $4,039.40

**Scenario Cost/Unit:** $4,039.40

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. | Hour | $125.73 | 2 | $251.46 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 1 | $49.30 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 1 | $4.83 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 0.5 | $31.81 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 2.5 | $98.58 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 30 | $1,101.30 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 15 | $514.80 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 5 | $131.05 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $227.38 | 4 | $909.52 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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 scenario 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 deflectors, 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:** 1.0

**Scenario Total Cost:** $6,001.41

**Scenario Cost/Unit:** $6,001.41

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. | Hour | $125.73 | 3 | $377.19 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 3 | $147.90 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 2 | $9.66 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 0.5 | $31.81 |
| **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. | Hour | $24.81 | 3 | $74.43 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 3 | $75.54 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 3.5 | $138.01 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 40 | $1,468.40 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 40 | $1,372.80 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 20 | $524.20 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $227.38 | 4 | $909.52 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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 scenario 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:** 1.0

**Scenario Total Cost:** $2,843.87

**Scenario Cost/Unit:** $2,843.87

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. | Hour | $125.73 | 6 | $754.38 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 6 | $641.46 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 6 | $148.86 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Materials** | | | | | | |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 6 | $205.92 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $8.91 | 9 | $80.19 |
| **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 | $539.90 | 1 | $539.90 |

## USDA - Natural Resources Conservation Service

**New York**

**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 scenario 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 across 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:** 1.0

**Scenario Total Cost:** $4,048.18

**Scenario Cost/Unit:** $4,048.18

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. | Hour | $125.73 | 4 | $502.92 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 4 | $197.20 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 30 | $1,101.30 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 6 | $205.92 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.55 | 20 | $11.00 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $227.38 | 4 | $909.52 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Yard

**Scenario Typical Size:** 250.0

**Scenario Total Cost:** $44,556.21

**Scenario Cost/Unit:** $178.22

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | $332.67 | 1.5 | $499.01 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 20 | $2,741.80 |
| 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. | Hour | $181.78 | 60 | $10,906.80 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 60 | $2,958.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 6 | $1,572.84 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 80 | $8,552.80 |
| **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. | Hour | $44.32 | 80 | $3,545.60 |
| 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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 220 | $8,674.60 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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 Yard

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $38,279.43

**Scenario Cost/Unit:** $76.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | $332.67 | 3 | $998.01 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 40 | $5,483.60 |
| 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. | Hour | $181.78 | 60 | $10,906.80 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 6 | $1,572.84 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 60 | $6,414.60 |
| **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. | Hour | $44.32 | 40 | $1,772.80 |
| 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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 160 | $6,308.80 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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 Yard

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $24,415.12

**Scenario Cost/Unit:** $122.08

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. | Hour | $61.96 | 40 | $2,478.40 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 20 | $2,741.80 |
| 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. | Hour | $181.78 | 20 | $3,635.60 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 20 | $986.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 2 | $524.28 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 40 | $4,276.40 |
| **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. | Hour | $44.32 | 20 | $886.40 |
| 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. | Hour | $24.81 | 40 | $992.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 140 | $5,520.20 |
| 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. | Hour | $49.27 | 20 | $985.40 |

**Mobilization**

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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:** 1.0

**Scenario Total Cost:** $36,004.02

**Scenario Cost/Unit:** $36,004.02

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 | $2.77 | 900 | $2,493.00 |
| 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. | Hour | $181.78 | 40 | $7,271.20 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 60 | $2,958.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 1 | $262.14 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hour | $118.36 | 3 | $355.08 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 40 | $4,276.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **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. | Hour | $44.32 | 40 | $1,772.80 |
| 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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 143 | $5,638.49 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 40 | $1,970.80 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 75 | $1,965.75 |
| Pipe, CMP, 96", 14 Gauge | 1835 | 96" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only. | Foot | $97.66 | 40 | $3,906.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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:** 1.0

**Scenario Total Cost:** $55,196.62

**Scenario Cost/Unit:** $55,196.62

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 | $2.77 | 900 | $2,493.00 |
| 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. | Hour | $181.78 | 40 | $7,271.20 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 60 | $2,958.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 1 | $262.14 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hour | $118.36 | 3 | $355.08 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 40 | $4,276.40 |
| **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. | Hour | $44.32 | 40 | $1,772.80 |
| 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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 143 | $5,638.49 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 40 | $1,970.80 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 75 | $1,965.75 |
| Footing, concrete, precast | 1836 | Precast spread footing with stemwall, T-shaped, with channel built to accept arched culvert leg. Includes materials only. | Foot | $60.88 | 80 | $4,870.40 |
| Geocell, 6" | 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 | $37.02 | 500 | $18,510.00 |
| Culvert, Multi-Plate arch | 1979 | Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings. | Pound | $1.38 | 1 | $1.38 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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:** 1.0

**Scenario Total Cost:** $64,036.24

**Scenario Cost/Unit:** $64,036.24

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 | $2.77 | 1000 | $2,770.00 |
| 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. | Hour | $181.78 | 40 | $7,271.20 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 60 | $2,958.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 1 | $262.14 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hour | $118.36 | 3 | $355.08 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 40 | $4,276.40 |
| **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. | Hour | $44.32 | 40 | $1,772.80 |
| 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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 143 | $5,638.49 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 40 | $1,970.80 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 75 | $1,965.75 |
| Culvert, box, 6' x 6' | 1837 | Precast concrete box culvert, 6'X6'. Typically in 4' sections. Includes materials only. | Foot | $335.86 | 40 | $13,434.40 |
| Geocell, 6" | 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 | $37.02 | 500 | $18,510.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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::** Foot

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $105,493.66

**Scenario Cost/Unit:** $3,516.46

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 Yard | $502.23 | 100 | $50,223.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 40 | $2,478.40 |
| 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. | Hour | $181.78 | 40 | $7,271.20 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 60 | $2,958.00 |
| 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 | Hour | $182.75 | 40 | $7,310.00 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 40 | $4,276.40 |
| **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. | Hour | $44.32 | 40 | $1,772.80 |
| 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. | Hour | $24.81 | 60 | $1,488.60 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 140 | $5,520.20 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |
| 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. | Hour | $104.31 | 120 | $12,517.20 |
| **Materials** | | | | | | |
| Dimension Lumber, Treated | 1044 | Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners | Board Foot | $0.92 | 1000 | $920.00 |
| Steel, structural steel members | 1779 | Structural steel, includes materials and fabrication. | Pound | $1.06 | 5360 | $5,681.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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::** Foot

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $338,388.21

**Scenario Cost/Unit:** $16,919.41

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 Yard | $502.23 | 500 | $251,115.00 |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | $332.67 | 3 | $998.01 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 60 | $3,717.60 |
| 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. | Hour | $181.78 | 80 | $14,542.40 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 80 | $3,944.00 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 6 | $1,572.84 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 | Hour | $182.75 | 60 | $10,965.00 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 60 | $6,414.60 |
| **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. | Hour | $44.32 | 80 | $3,545.60 |
| 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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 240 | $9,463.20 |
| 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. | Hour | $49.27 | 80 | $3,941.60 |
| 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. | Hour | $104.31 | 240 | $25,034.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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 Yard

**Scenario Typical Size:** 60.0

**Scenario Total Cost:** $48,334.12

**Scenario Cost/Unit:** $805.57

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | $332.67 | 0.5 | $166.34 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 1000 | $2,770.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 50 | $319.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 80 | $4,956.80 |
| 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. | Hour | $181.78 | 60 | $10,906.80 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 80 | $3,944.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hour | $118.36 | 3 | $355.08 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 40 | $4,276.40 |
| **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. | Hour | $44.32 | 60 | $2,659.20 |
| 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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 263 | $10,370.09 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 40 | $1,970.80 |
| **Materials** | | | | | | |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 75 | $1,965.75 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 3 | $1,619.70 |

**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:** 126.0

**Scenario Total Cost:** $7,775.72

**Scenario Cost/Unit:** $61.71

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 Yard | $1.76 | 160 | $281.60 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 84 | $6,730.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #6 - Pipe Drop, Plastic

**Scenario Description:**

A full flow pipe drop (i.e.: 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 Foot

**Scenario Typical Size:** 188.0

**Scenario Total Cost:** $5,258.53

**Scenario Cost/Unit:** $27.97

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 Yard | $502.23 | 1 | $502.23 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 100 | $483.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 20 | $127.60 |
| 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. | Hour | $125.73 | 2 | $251.46 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 2 | $78.86 |
| **Materials** | | | | | | |
| Pipe, PVC, 18", SCH 40 | 1373 | Materials: - 18" - PVC - SCH 40 - ASTM D1785 | Foot | $35.41 | 40 | $1,416.40 |
| Coupling, PVC, Tee, 24x18, SCH 40 | 1374 | Materials: - Tee, 24"x18" - PVC - SCH 40 - ASTM D1785 | Each | $1,642.11 | 1 | $1,642.11 |
| Pipe, PVC, 24", ASTM-2241, SDR 26 | 1945 | Materials: -24" -PVC - ASTM 2241, SDR 26 | Foot | $32.92 | 6 | $197.52 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 410 - Grade Stabilization Structure

**Scenario** #7 - Pipe Drop, Steel

**Scenario Description:**

A full flow pipe drop (i.e.: 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 Foot

**Scenario Typical Size:** 940.0

**Scenario Total Cost:** $15,398.77

**Scenario Cost/Unit:** $16.38

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 Yard | $4.83 | 600 | $2,898.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 100 | $638.00 |
| 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. | Hour | $125.73 | 4 | $502.92 |
| **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. | Hour | $44.32 | 11 | $487.52 |
| 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. | Hour | $24.81 | 10 | $248.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| **Materials** | | | | | | |
| Steel, Plate, 1/8" | 1047 | Flat Steel Plate, 1/8" thick, materials only. | Square Foot | $3.95 | 30 | $118.50 |
| Pipe, Steel, 30", Std Wt, USED | 1361 | Materials: - USED - 30" - Steel Std Wt | Foot | $83.21 | 100 | $8,321.00 |
| Pipe, Steel, 36", Std Wt, USED | 1362 | Materials: - USED - 36" - Steel Std Wt | Foot | $106.25 | 12 | $1,275.00 |
| Steel, Plate, 3/8" | 1375 | Flat steel plate, 3/8" thickness. Materials only. | Square Foot | $12.04 | 9 | $108.36 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 (i.e.: 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 Foot

**Scenario Typical Size:** 90.0

**Scenario Total Cost:** $9,657.25

**Scenario Cost/Unit:** $107.30

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 Yard | $502.23 | 9 | $4,520.07 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 9 | $24.93 |
| 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 Yard | $2.56 | 40 | $102.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 75 | $362.25 |
| 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. | Hour | $125.73 | 5 | $628.65 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $24.81 | 30 | $744.30 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 5 | $197.15 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 3 | $93.75 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 11 | $403.81 |
| Corrugated Steel, 12 Gauge, galvanized | 1376 | Corrugated Steel, 12 gauge, 3" by 1" corrugations, galvanized, meets ASTM A 929. Materials only. | Square Foot | $7.32 | 212 | $1,551.84 |
| Pipe, CMP, 12", 14 Gauge | 1377 | 12" - Corrugated Steel Pipe. Galvanized, uncoated. 14 Gauge. Materials only. | Foot | $9.67 | 2 | $19.34 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 (i.e.: 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 Foot

**Scenario Typical Size:** 48.0

**Scenario Total Cost:** $3,958.44

**Scenario Cost/Unit:** $82.47

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 | $2.77 | 23 | $63.71 |
| 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 Yard | $2.56 | 7 | $17.92 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 40 | $193.20 |
| 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. | Hour | $125.73 | 5 | $628.65 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hour | $118.36 | 3 | $355.08 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 5 | $197.15 |
| 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. | Hour | $49.27 | 10 | $492.70 |
| **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 Yard | $170.91 | 7 | $1,196.37 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 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), Structure 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:** 1.0

**Scenario Total Cost:** $5,992.66

**Scenario Cost/Unit:** $5,992.66

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 | $2.77 | 11 | $30.47 |
| 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 Yard | $2.56 | 10 | $25.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 40 | $193.20 |
| 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. | Hour | $125.73 | 12 | $1,508.76 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 4 | $19.32 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| Tractor, agricultural, 210 HP | 1201 | Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included. | Hour | $118.36 | 20 | $2,367.20 |
| 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. | Hour | $17.58 | 1 | $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. | Hour | $24.81 | 20 | $496.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| 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. | Hour | $49.27 | 5 | $246.35 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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, terraces, 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 preparation, seeding, lime, fertilizer 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 according 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $5,113.70

**Scenario Cost/Unit:** $5,113.70

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. | Acre | $12.32 | 1 | $12.32 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 806 | $789.88 |
| 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 Yard | $1.76 | 1739 | $3,060.64 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.5 | $188.08 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.25 | $90.49 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.25 | $67.41 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 60 | $38.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 60 | $21.60 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 2 | $186.46 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Three Species Mix, Cool Season, Introduced Perennial Grass | 2315 | Cool season, introduced grass mix. Includes material and shipping only. | Acre | $45.35 | 1 | $45.35 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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, terraces, 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 preparation, seeding, lime, fertilizer 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 according 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 Foot

**Scenario Typical Size:** 6,970.0

**Scenario Total Cost:** $1,167.01

**Scenario Cost/Unit:** $0.17

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. | Acre | $12.32 | 0.16 | $1.97 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 0.16 | $1.17 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.16 | $3.78 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 130 | $127.40 |
| 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 Yard | $1.76 | 280 | $492.80 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.08 | $30.09 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.04 | $14.48 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.04 | $10.78 |
| **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. | Hour | $24.81 | 1 | $24.81 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **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 | $0.50 | 5 | $2.50 |
| 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 | $0.64 | 10 | $6.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 10 | $3.60 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 0.32 | $29.83 |
| Three Species Mix, Cool Season, Introduced Perennial Grass | 2315 | Cool season, introduced grass mix. Includes material and shipping only. | Acre | $45.35 | 0.16 | $7.26 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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, terraces, 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 preparation, seeding, lime, fertilizer 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 according 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,819.07

**Scenario Cost/Unit:** $6,819.07

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. | Hour | $61.96 | 7 | $433.72 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 1 | $12.32 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 806 | $789.88 |
| 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 Yard | $1.76 | 1739 | $3,060.64 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.5 | $188.08 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.25 | $90.49 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.25 | $67.41 |
| **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. | Hour | $24.81 | 11 | $272.91 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 36 | $1,125.00 |
| 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 | $0.50 | 30 | $15.00 |
| 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 | $0.64 | 60 | $38.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 50 | $18.00 |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $1.22 | 181 | $220.82 |
| Three Species Mix, Cool Season, Introduced Perennial Grass | 2315 | Cool season, introduced grass mix. Includes material and shipping only. | Acre | $45.35 | 1 | $45.35 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #1 - Pollinator Habitat

**Scenario Description:**

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 provides pollen and nectar throughout the growing season by establishing a diverse mixture of flowering plants. Typically a mixture of 5 or more species is planted to improve diversity so that pollen and nectar are available as long as possible. 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. A locally adapted mixture of at 3 pollen and nectar producing plants will be drilled into the site. The species list in the component section of this scenario are strictly for deriving a cost. 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. Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Pollen and nectar sources are lacking or are only available for part of the growing season. Large cropland tracks lack undisturbed areas for ground nesting bees

**After Situation:**

Flowering plants supply pollen and nectar throughout the growing season. Undisturbed areas provide nesting sites for bees and other native pollinators.

**Feature Measure:** Length of Hedgerow

**Scenario Unit::** Foot

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $1,937.19

**Scenario Cost/Unit:** $2.42

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. | Acre | $18.35 | 0.25 | $4.59 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.25 | $5.90 |
| 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. | Hour | $12.04 | 2.5 | $30.10 |
| **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. | Hour | $24.81 | 2.5 | $62.03 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 100 | $61.00 |
| Tree shelter, mesh tree tube, 24" | 1555 | 24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.52 | 100 | $52.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallon | $28.77 | 0.25 | $7.19 |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 3 | $1,714.38 |

**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::** Foot

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $775.29

**Scenario Cost/Unit:** $0.97

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. | Acre | $18.35 | 0.25 | $4.59 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.25 | $5.90 |
| 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. | Hour | $12.04 | 2.5 | $30.10 |
| **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. | Hour | $24.81 | 2.5 | $62.03 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 100 | $61.00 |
| Tree shelter, mesh tree tube, 24" | 1555 | 24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.52 | 100 | $52.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallon | $28.77 | 0.25 | $7.19 |
| Two Species Mix, Warm Season, Native Perennial Grass | 2325 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $92.08 | 6 | $552.48 |

**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::** Foot

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $585.61

**Scenario Cost/Unit:** $0.73

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. | Acre | $18.35 | 0.25 | $4.59 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.25 | $5.90 |
| 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. | Hour | $12.04 | 2.5 | $30.10 |
| **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. | Hour | $24.81 | 2.5 | $62.03 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 100 | $61.00 |
| Tree shelter, mesh tree tube, 24" | 1555 | 24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.52 | 100 | $52.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallon | $28.77 | 0.25 | $7.19 |
| Three Species Mix, Cool Season, Introduced Perennial Grass | 2315 | Cool season, introduced grass mix. Includes material and shipping only. | Acre | $45.35 | 8 | $362.80 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #4 - Wildlife, Handplanted Trees and Shrubs with Warm Season Grass

**Scenario Description:**

Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native warm season grasses 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. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated 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. Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. 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::** Foot

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $771.69

**Scenario Cost/Unit:** $0.96

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. | Acre | $18.35 | 0.25 | $4.59 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.25 | $5.90 |
| 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. | Hour | $12.04 | 2.5 | $30.10 |
| **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. | Hour | $24.81 | 2.5 | $62.03 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 90 | $51.30 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 10 | $6.10 |
| Tree shelter, mesh tree tube, 24" | 1555 | 24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.52 | 100 | $52.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallon | $28.77 | 0.25 | $7.19 |
| Two Species Mix, Warm Season, Native Perennial Grass | 2325 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $92.08 | 6 | $552.48 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #5 - Wildlife, Machine Planted Trees and Shrubs with Warm Season Grass

**Scenario Description:**

This scenario is for machine planting of woody species. Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native grasses 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. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated 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. Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. 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::** Foot

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $926.95

**Scenario Cost/Unit:** $1.16

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. | Acre | $18.35 | 0.25 | $4.59 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.25 | $5.90 |
| 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. | Hour | $6.84 | 1 | $6.84 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 90 | $51.30 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 10 | $6.10 |
| Tree shelter, mesh tree tube, 24" | 1555 | 24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.52 | 100 | $52.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallon | $28.77 | 0.25 | $7.19 |
| Two Species Mix, Warm Season, Native Perennial Grass | 2325 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $92.08 | 6 | $552.48 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** 422 - Hedgerow Planting

**Scenario** #6 - Wildlife, Handplanted Trees and Shrubs with Cool Season Grass

**Scenario Description:**

Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat connectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants. Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A native cool season 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. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated 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. Payment is based on the length of each hedgerow times the number of rows.

**Before Situation:**

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

**After Situation:**

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. 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::** Foot

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $533.31

**Scenario Cost/Unit:** $0.67

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. | Acre | $18.35 | 0.25 | $4.59 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.25 | $5.90 |
| 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. | Hour | $12.04 | 2.5 | $30.10 |
| **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. | Hour | $24.81 | 2.5 | $62.03 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 90 | $51.30 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 10 | $6.10 |
| Tree shelter, mesh tree tube, 24" | 1555 | 24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.52 | 100 | $52.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallon | $28.77 | 0.25 | $7.19 |
| One Species, Cool Season, Native Perennial Grass | 2312 | Native, cool season perennial grass. Includes material and shipping only. | Acre | $157.05 | 2 | $314.10 |

**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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $3,292.77

**Scenario Cost/Unit:** $2.49

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. | Hour | $12.04 | 40 | $481.60 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal. | 1531 | Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.54 | 82 | $372.28 |
| Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal. | 1536 | Potted conifer, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.41 | 82 | $361.62 |
| Tree shelter, mesh tree tube, 24" | 1555 | 24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.52 | 164 | $85.28 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallon | $28.77 | 0.25 | $7.19 |

**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 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::** Foot

**Scenario Typical Size:** 720.0

**Scenario Total Cost:** $1,901.44

**Scenario Cost/Unit:** $2.64

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. | Acre | $18.35 | 0.1 | $1.84 |
| **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. | Hour | $24.81 | 40 | $992.40 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, potted, 1 qt. | 1524 | Potted shrub, 1 quart. Includes materials and shipping only. | Each | $2.52 | 360 | $907.20 |

**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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $3,385.05

**Scenario Cost/Unit:** $2.56

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. | Acre | $18.35 | 0.6 | $11.01 |
| 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. | Hour | $12.04 | 40 | $481.60 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, potted, 1 qt. | 1524 | Potted shrub, 1 quart. Includes materials and shipping only. | Each | $2.52 | 60 | $151.20 |
| Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal. | 1531 | Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.54 | 75 | $340.50 |
| Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal. | 1536 | Potted conifer, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.41 | 75 | $330.75 |
| Tree shelter, mesh tree tube, 24" | 1555 | 24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $0.52 | 150 | $78.00 |
| Animal repellent, chemical | 1907 | Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only. | Gallon | $28.77 | 0.25 | $7.19 |

**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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $7,359.54

**Scenario Cost/Unit:** $5.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1320 | $1,980.00 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 4", SDR 26 | 989 | Materials: - 4" - PVC - SDR 26 160 psi - ASTM D2241 | Foot | $2.69 | 1452 | $3,905.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $31,101.24

**Scenario Cost/Unit:** $23.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1320 | $4,540.80 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 13801 | $24,289.76 |
| **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 | $539.90 | 2 | $1,079.80 |

**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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $13,448.16

**Scenario Cost/Unit:** $10.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1320 | $1,980.00 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hour | $23.79 | 5 | $118.95 |
| **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. | Hour | $24.81 | 26 | $645.06 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $2.09 | 4851 | $10,138.59 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $33,335.83

**Scenario Cost/Unit:** $25.25

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1320 | $4,540.80 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hour | $23.79 | 16 | $380.64 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $2.09 | 12755 | $26,657.95 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #7 - 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 2-inch to 24-inch; and typical scenario size is 2-inch. Construct 1/4 mile (1,320 feet) of 2-inch, Class 200 (SDR-9.0), HDPE pipeline with appurtenances, installed on the ground surface. The unit is weight of pipe material in pounds. 1,320 feet of 2-inch, Class 200 (SDR-9.0), HDPE weighs 0.744 lb/ft, or a total of 982 pounds. Appurtenances include: fittings, air vents, pressure relief valves, anchors, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% 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:** 982.0

**Scenario Total Cost:** $2,987.81

**Scenario Cost/Unit:** $3.04

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hour | $23.79 | 5 | $118.95 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $2.09 | 1108 | $2,315.72 |
| **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 | $78.09 | 2 | $156.18 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #8 - HDPE (Corrugated Plastic Pipe)

**Scenario Description:**

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline. HDPE (CPP) Twin-Wall is manufactured in sizes (nominal diameter) from 4-inch to 60-inch; typical practice sizes range from 12-inch to 24-inch; and typical scenario size is 18-inch. Construct 1/8 mile (660 feet) of 18-inch, Twin-Wall, HDPE Corrugated Plastic Pipe (CPP) with a smooth interior, and appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is in weight of pipe material in pounds. 660 feet of 18-inch, Twin-Wall, HDPE CPP weighs 6.40 lb/ft, or a total of 4,224 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:** 4,224.0

**Scenario Total Cost:** $12,365.60

**Scenario Cost/Unit:** $2.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 30" x 48" | 1384 | Trenching, earth, 30" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $4.21 | 660 | $2,778.60 |
| **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. | Hour | $24.81 | 64 | $1,587.84 |
| **Materials** | | | | | | |
| Pipe, HDPE, corrugated single wall, <= 12" weight priced Compound | 1380 | High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only. | Pound | $1.60 | 4646 | $7,433.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #9 - Steel (Iron Pipe Size) 8" or less

**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 2-inch to 18-inch; and typical scenario size is 6-inch. Construct 1/4 mile (1,320 feet) of 6-inch, Schedule 10, Galvanized Steel Pipe with appurtenances, installed below ground with a minimum feet of ground cover. The unit is the weight of pipe material in pounds. 1,320 feet of 6-inch, Schedule 10, Galvanized Steel Pipe weighs 9.289 lb/ft, for t total of 12, 261 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). 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:** 12,261.0

**Scenario Total Cost:** $27,737.40

**Scenario Cost/Unit:** $2.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1320 | $1,980.00 |
| **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. | Hour | $24.81 | 64 | $1,587.84 |
| **Materials** | | | | | | |
| Pipe, steel, smooth wall, galvanized, weight priced | 1381 | Steel manufactured into galvanized smooth wall pipe | Pound | $1.75 | 13488 | $23,604.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #10 - Steel (Iron Pipe Size) 10" or greater

**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 2-inch to 18-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 12-inch, Schedule 10, Galvanized Steel Pipe with appurtenances, installed below ground with a minimum feet of ground cover. The unit is the weight of pipe material in pounds. 1,320 feet of 12-inch, Schedule 10, Galvanized Steel Pipe weighs 24.16 lb/ft, for t total of 31,891 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). 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:** 31,891.0

**Scenario Total Cost:** $68,878.12

**Scenario Cost/Unit:** $2.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1320 | $4,540.80 |
| **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. | Hour | $24.81 | 96 | $2,381.76 |
| **Materials** | | | | | | |
| Pipe, steel, smooth wall, galvanized, weight priced | 1381 | Steel manufactured into galvanized smooth wall pipe | Pound | $1.75 | 35080 | $61,390.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #11 - 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 2-inch to 18-inch; and typical scenario size is 2-inch. Construct 1/4 mile (1,320 feet) of 2-inch, Schedule 40, Galvanized Steel Pipe with appurtenances, installed on the ground surface. The unit is weight of pipe material in pounds. 1,320 feet of 2-inch, Schedule 40, Galvanized Steel Pipe weighs 3.653 lb/ft, or a total of 4,822 pounds . Appurtenances include: couplings, fittings, air vents, pressure relief valves, anchors, expansion joints, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% 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:** 4,822.0

**Scenario Total Cost:** $10,894.63

**Scenario Cost/Unit:** $2.26

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. | Hour | $24.81 | 48 | $1,190.88 |
| **Materials** | | | | | | |
| Pipe, steel, smooth wall, galvanized, weight priced | 1381 | Steel manufactured into galvanized smooth wall pipe | Pound | $1.75 | 5545 | $9,703.75 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #12 - Steel (Corrugated Steel Pipe)

**Scenario Description:**

Description: Below ground installation of Corrugated Steel Pipe (CSP) pipeline. Steel (CSP) is manufactured in sizes (nominal diameter) from 12-inch to 72-inch; typical practice sizes range from 12-inch to 24-inch; and typical scenario size is 18-inch. Construct 1/8 mile (660 feet) of 18-inch, 14-gauge, Galvanized Corrugated Steel Pipe (CSP) with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 660 feet of 18-inch, 14-gauge, Galvanized CSP weighs 18.0 lb/ft, or a total of 11,800 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:** 11,880.0

**Scenario Total Cost:** $17,351.52

**Scenario Cost/Unit:** $1.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 30" x 48" | 1384 | Trenching, earth, 30" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $4.21 | 660 | $2,778.60 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| **Materials** | | | | | | |
| Pipe, CMP, 14-12 gauge, weight priced | 1589 | 14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only. | Pound | $0.88 | 13662 | $12,022.56 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #13 - Surface Aluminum (Aluminum Irrigation Pipe)

**Scenario Description:**

Description: On-ground surface installation of Aluminum Irrigation Pipe (AIP) pipeline. AIP is manufactured in sizes (nominal diameter) from 2-inch to 12-inch; typical practice sizes range from 6-inch to 12-inch; and typical scenario size is 8-inch. Construct 1/8 mile (660 feet) of 8-inch, 0.050-inch wall, Aluminum Irrigation Pipe (AIP) with appurtenances, installed on the ground surface. The unit is weight of pipe in pounds of pipe material. 660 feet of 8-inch, 0.050-inch wall, AIP weighs 1.47 lb/ft, or a total of 970 pounds. 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. 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:** 970.0

**Scenario Total Cost:** $5,277.40

**Scenario Cost/Unit:** $5.44

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. | Hour | $24.81 | 8 | $198.48 |
| **Materials** | | | | | | |
| Pipe, aluminum, smooth wall, weight priced | 1382 | Aluminum manufactured into smooth wall pipe | Pound | $4.76 | 1067 | $5,078.92 |

**Practice:** 430 - Irrigation Pipeline

**Scenario** #26 - HDPE (Iron Pipe Size & Tubing) 3" 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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $6,045.92

**Scenario Cost/Unit:** $4.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1320 | $1,980.00 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hour | $23.79 | 5 | $118.95 |
| **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. | Hour | $24.81 | 24 | $595.44 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $2.09 | 1333 | $2,785.97 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $19,973.18

**Scenario Cost/Unit:** $15.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1320 | $4,540.80 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| **Materials** | | | | | | |
| Pipe, PVC, 8", SCH 40 | 981 | Materials: - 8" - PVC - SCH 40 - ASTM D1785 | Foot | $8.65 | 1584 | $13,701.60 |
| **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 | $539.90 | 1 | $539.90 |

**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 Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $19,377.74

**Scenario Cost/Unit:** $14.68

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1320 | $4,540.80 |
| **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. | Hour | $24.81 | 24 | $595.44 |
| **Materials** | | | | | | |
| Pipe, PVC, 8", SCH 40 | 981 | Materials: - 8" - PVC - SCH 40 - ASTM D1785 | Foot | $8.65 | 1584 | $13,701.60 |
| **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 | $539.90 | 1 | $539.90 |

**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 Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $21,012.20

**Scenario Cost/Unit:** $15.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1320 | $1,980.00 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hour | $23.79 | 5 | $118.95 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $2.09 | 8209 | $17,156.81 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $8,534.90

**Scenario Cost/Unit:** $6.47

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1320 | $1,980.00 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hour | $23.79 | 5 | $118.95 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $2.09 | 2239 | $4,679.51 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $43,002.50

**Scenario Cost/Unit:** $32.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1320 | $4,540.80 |
| Fuser for HDPE Pipe | 1383 | Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor. | Hour | $23.79 | 16 | $380.64 |
| **Materials** | | | | | | |
| Pipe, HDPE, smooth wall, weight priced | 1379 | High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only. | Pound | $2.09 | 17950 | $37,515.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Yard

**Scenario Typical Size:** 4,500.0

**Scenario Total Cost:** $27,289.26

**Scenario Cost/Unit:** $6.06

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 Yard | $4.83 | 4500 | $21,735.00 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 12" | 1244 | Pipe, Corrugated HDPE Double Wall, 12" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $6.79 | 36 | $244.44 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 18" | 1245 | Pipe, Corrugated HDPE Double Wall, 18" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $12.81 | 120 | $1,537.20 |
| Screw gate, cast iron, 18" diameter, 10/0 head | 1917 | 18" diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only. | Each | $1,056.34 | 1 | $1,056.34 |
| Coupling, HDPE CPT Dual Wall, Tee, 18"x18"x12" | 1921 | Tee, 18"x18"x12" - HDPE CPT Tee. Materials only. | Each | $279.80 | 1 | $279.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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 Yard

**Scenario Typical Size:** 28,500.0

**Scenario Total Cost:** $142,629.25

**Scenario Cost/Unit:** $5.00

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 Yard | $4.83 | 28500 | $137,655.00 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 10" | 1243 | Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only. | Foot | $6.02 | 100 | $602.00 |
| Screw gate, cast iron, 10" diameter, 10/0 head | 1916 | 10" diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only. | Each | $726.17 | 1 | $726.17 |
| Catwalk, metal | 1918 | Metal pedestrian walk way giving access to the valve on a structure, typically 3' wide with railing. Materials only. | Foot | $60.48 | 20 | $1,209.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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 Yard

**Scenario Typical Size:** 104,200.0

**Scenario Total Cost:** $524,412.10

**Scenario Cost/Unit:** $5.03

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 Yard | $4.83 | 104200 | $503,286.00 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Pipe, Steel, 18", Std Wt | 1366 | Materials: - 18" - Steel Std Wt | Foot | $139.58 | 100 | $13,958.00 |
| Screw gate, cast iron, 18" diameter, 10/0 head | 1917 | 18" diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only. | Each | $1,056.34 | 1 | $1,056.34 |
| Catwalk, metal | 1918 | Metal pedestrian walk way giving access to the valve on a structure, typically 3' wide with railing. Materials only. | Foot | $60.48 | 50 | $3,024.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 3 | $1,619.70 |

**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 Yard

**Scenario Typical Size:** 19,600.0

**Scenario Total Cost:** $51,538.58

**Scenario Cost/Unit:** $2.63

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 Yard | $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 | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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::** Gallon

**Scenario Typical Size:** 20,000.0

**Scenario Total Cost:** $30,376.45

**Scenario Cost/Unit:** $1.52

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. | Hour | $49.30 | 10 | $493.00 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hour | $5.60 | 16 | $89.60 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 16 | $630.88 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 8 | $246.72 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 12 | $258.60 |
| 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 | $23,980.31 | 1 | $23,980.31 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Gallon

**Scenario Typical Size:** 3,000.0

**Scenario Total Cost:** $5,691.86

**Scenario Cost/Unit:** $1.90

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. | Hour | $49.30 | 6 | $295.80 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hour | $5.60 | 4 | $22.40 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 6 | $236.58 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallon | $0.93 | 3000 | $2,790.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 2 | $43.10 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Gallon

**Scenario Typical Size:** 10,000.0

**Scenario Total Cost:** $11,720.02

**Scenario Cost/Unit:** $1.17

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. | Hour | $49.30 | 8 | $394.40 |
| Plate compactor | 1915 | Manually guided vibratroy plate compactor. Equipment only. | Hour | $5.60 | 4 | $22.40 |
| **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. | Hour | $24.81 | 40 | $992.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 6 | $129.30 |
| Tank, Fiberglass Enclosed Storage, 10,000 gallon | 1919 | 10,000 gallon capacity enclosed fiberglass water storage tank. Includes tank anchoring materials and delivery. | Each | $7,961.86 | 1 | $7,961.86 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $29,279.26

**Scenario Cost/Unit:** $2,927.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1800 | $2,700.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 984 | $1,731.84 |
| Micro Irrigation, Media Filter, 30" to 48" 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 | $5,211.81 | 2 | $10,423.62 |
| 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 | $336.75 | 1 | $336.75 |
| 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 | $1,323.03 | 1 | $1,323.03 |
| 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. | Foot | $0.10 | 95832 | $9,583.20 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**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 nursery 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $57,208.65

**Scenario Cost/Unit:** $2,860.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 2700 | $4,050.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 2520 | $4,435.20 |
| Micro Irrigation, Media Filter, 30" to 48" 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 | $5,211.81 | 2 | $10,423.62 |
| 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 | $336.75 | 1 | $336.75 |
| 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. | Foot | $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 | $190.19 | 1 | $190.19 |

**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 nursery 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $48,205.97

**Scenario Cost/Unit:** $2,410.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 2700 | $4,050.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 2520 | $4,435.20 |
| 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 | $336.75 | 1 | $336.75 |
| 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. | Foot | $0.34 | 106480 | $36,203.20 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

**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 container-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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $104,759.48

**Scenario Cost/Unit:** $10,475.95

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1800 | $2,700.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 788 | $1,386.88 |
| 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 | $336.75 | 1 | $336.75 |
| 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 | $1,323.03 | 1 | $1,323.03 |
| 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. | Foot | $1.00 | 95832 | $95,832.00 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

**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 nursery 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 quantities 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $63,841.40

**Scenario Cost/Unit:** $3,192.07

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 2700 | $4,050.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 2520 | $4,435.20 |
| Micro Irrigation, Media Filter, 30" to 48" 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 | $5,211.81 | 3 | $15,635.43 |
| 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 | $336.75 | 1 | $336.75 |
| 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. | Foot | $0.34 | 106480 | $36,203.20 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

**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 quantities 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $14,416.09

**Scenario Cost/Unit:** $1,441.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1100 | $1,650.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 303 | $533.28 |
| Micro Irrigation, Media Filter, 30" to 48" 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 | $5,211.81 | 2 | $10,423.62 |
| 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 | $49.31 | 1 | $49.31 |
| **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 | $190.19 | 1 | $190.19 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,413.41

**Scenario Cost/Unit:** $541.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1100 | $1,650.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 303 | $533.28 |
| 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 | $49.31 | 1 | $49.31 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

**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 quantities 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $15,837.03

**Scenario Cost/Unit:** $1,583.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1100 | $1,650.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 303 | $533.28 |
| Micro Irrigation, Media Filter, 30" to 48" 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 | $5,211.81 | 2 | $10,423.62 |
| 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 | $49.31 | 1 | $49.31 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

**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 quantities 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 container-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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $115,201.10

**Scenario Cost/Unit:** $11,520.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1800 | $2,700.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 788 | $1,386.88 |
| Micro Irrigation, Media Filter, 30" to 48" 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 | $5,211.81 | 2 | $10,423.62 |
| 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 | $336.75 | 1 | $336.75 |
| 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 | $1,323.03 | 1 | $1,323.03 |
| 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. | Foot | $1.00 | 95850 | $95,850.00 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $61,275.80

**Scenario Cost/Unit:** $3,063.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 2700 | $4,050.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 2520 | $4,435.20 |
| 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 | $336.75 | 1 | $336.75 |
| 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 | $1,323.03 | 1 | $1,323.03 |
| 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. | Foot | $1.00 | 47950 | $47,950.00 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $76,911.23

**Scenario Cost/Unit:** $3,845.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 2700 | $4,050.00 |
| Micro Irrigation, chemical injection equipment | 1987 | Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included. | Each | $1,470.45 | 1 | $1,470.45 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 2520 | $4,435.20 |
| Micro Irrigation, Media Filter, 30" to 48" 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 | $5,211.81 | 3 | $15,635.43 |
| 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 | $336.75 | 1 | $336.75 |
| 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 | $1,323.03 | 1 | $1,323.03 |
| 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. | Foot | $1.00 | 47950 | $47,950.00 |
| Water Meter, Microirrigation, >2" and <= 8", with Volume Totalizer | 2523 | Microirrigation water meter greater than 2" and less than or equal to 8 inch diameter, with volume totalizer. Includes materials only. | Each | $1,420.94 | 1 | $1,420.94 |
| **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 | $190.19 | 1 | $190.19 |

**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 appurtenances. 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 Foot

**Scenario Typical Size:** 2,178.0

**Scenario Total Cost:** $205.03

**Scenario Cost/Unit:** $0.09

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. | Foot | $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 | $49.31 | 1 | $49.31 |

**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::** Foot

**Scenario Typical Size:** 885.0

**Scenario Total Cost:** $72,907.23

**Scenario Cost/Unit:** $82.38

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. | Hour | $24.81 | 1 | $24.81 |
| **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 | $6,441.55 | 1 | $6,441.55 |
| 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. | Foot | $70.54 | 885 | $62,427.90 |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,652.10 | 1 | $3,652.10 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 1,280.0

**Scenario Total Cost:** $130,251.74

**Scenario Cost/Unit:** $101.76

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. | Hour | $24.81 | 1 | $24.81 |
| **Materials** | | | | | | |
| Linear Move System with appurtenances | 322 | Linear/lateral move system including: central tower, lateral towers, pipes, sprinklers, controllers, installation. | Acre | $1,660.71 | 76 | $126,213.96 |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,652.10 | 1 | $3,652.10 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 885.0

**Scenario Total Cost:** $11,212.31

**Scenario Cost/Unit:** $12.67

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. | Hour | $46.63 | 6 | $279.78 |
| **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. | Hour | $24.81 | 7 | $173.67 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 6 | $151.08 |
| **Materials** | | | | | | |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,652.10 | 1 | $3,652.10 |
| 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. | Foot | $7.54 | 885 | $6,672.90 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 442 - Sprinkler System

**Scenario** #4 - Pivoting Linear Move

**Scenario Description:**

Installation of a pivoting linear or lateral move sprinkler system with sprinklers on drops with or without drag hoses to improve irrigation efficiency and reduce soil erosion. It will turn to irrigate adjacent 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), 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 unit turns to be able to irrigate an adjacent field. 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 main system

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,280.0

**Scenario Total Cost:** $150,470.84

**Scenario Cost/Unit:** $117.56

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. | Hour | $24.81 | 1 | $24.81 |
| **Materials** | | | | | | |
| Flow Meter, with Electronic Index | 1452 | 10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only. | Each | $3,652.10 | 1 | $3,652.10 |
| Irrigation, Lateral Move Pivot, Fixed Cost Portion | 2448 | Fixed cost portion of a lateral move pivot system with appurtenances. This portion includes all sprinkers, installation, pipe, tower. | Each | $1.06 | 1 | $1.06 |
| Irrigation, Lateral Move Pivot, Variable Cost Portion | 2449 | Variable cost portion of lateral move pivot system with appurtenances. This portion includes all sprinkers, installation, pipe, tower. | Foot | $114.40 | 1280 | $146,432.00 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 442 - Sprinkler System

**Scenario** #5 - Traveling gun <2"

**Scenario Description:**

A portable small gun system used to apply liquid waste on small fields. A small traveling gun system is installed to apply waste water uniformly and at an acceptable application rate operated under pressure to effectively irrigate less than 3 acres. The system is installed with all necessary appurtenances. Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

**Before Situation:**

An existing traveling gun on a 5 acre field is inefficient and is not applying water uniformly or not at an acceptable application rate. Excess applied water causes irrigation induced erosion, runoff and deep percolation. The runoff and deep percolation degrade the receiving waters.

**After Situation:**

An existing waste application system on a 5 acre field is inefficient and is not applying waste uniformly or not at an acceptable application rate. Excess applied waste causes vegetative treatment strip, runoff and deep percolation of nutrients. The runoff and deep percolation degrade the receiving waters. Associated Practices: Waste Transfer, CNMP (102),

**Feature Measure:** Number of Traveling Gun Systems

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $11,945.72

**Scenario Cost/Unit:** $11,945.72

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Traveling Gun System with <= 2" Nominal size hose, and appurtenances light duty | 1478 | Irrigation, Traveling Gun System with <= 2" Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 500' | Inch Diameter | $11,945.72 | 1 | $11,945.72 |

**Practice:** 442 - Sprinkler System

**Scenario** #6 - Traveling Gun, 2" or >

**Scenario Description:**

A portable big gun system used to apply waste water from animal feeding operations. This traveling big gun unit includes a sprinkler, towable cart, 1000’ or more of PE hard hose, a self propelled reel that moves the sprinkler toward the reel during operation. The reel attaches to a mainline with appropriately designed towpath width. The scenario describes an irrigation system that is typical to confined animal feeding operations. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

**Before Situation:**

A confined, animal operation has a waste management system that exceeds its capacity, or a operation that does not have a waste management system in place. The inefficiency of the existing system or the lack of a waste management system has an impact on the soil and water quality. Animal waste runs off and degrades the receiving waters.

**After Situation:**

The big gun applies animal manure in an appropriate quantity and location that eliminates both runoff of the manure and deep percolation of excess nutrients, salts, and pathogens. The big gun system is typically located on 50 acres or less of hay/pasture land, or 100 acres or less of cropland. The system includes a large irrigation gun with 1” to 1½” orifice mounted onto a movable cart. 1000’ or more flexible 2.5 - 3” PE pipe is attached to the cart on one end and a large reel on the other end. The reel serves as storage are for the pipe as the cart moves back to the reel. The reel is turned by a small engine which gradually pulls the flexible pipe and cart back to the reel/base.

**Feature Measure:** No. of systems

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $23,425.92

**Scenario Cost/Unit:** $23,425.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Irrigation, Traveling Gun System, > 2" to 3 " Nominal size hose | 1479 | Irrigation, Traveling Gun System with 2.3 to 3 " Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, controls, and installation. Normal hose length 1000'. | Inch Diameter | $7,808.64 | 3 | $23,425.92 |

**Practice:** 443 - Irrigation System, Surface and Subsurface

**Scenario** #9 - Surge Valve & Controller

**Scenario Description:**

This scenario would typically include installation and utilization of a 10-inch surge valve with automated controller (including all appurtenances) and installation labor needed to convert from a conventional surface irrigated system to a surge irrigation system. Typical field size is 80 acres. The surge valve will be used with PVC Gated Pipe or PE Gated Tubing to convey and distribute irrigation water to alternating irrigation sets in a timed surge cycle that results in reduced a surging irrigation application. The surging action increases rate of advance along set length, reduces deep percolation at upper end of field, increases uniformity of application along row length, and on lower intake soils can significantly reduce runoff losses. The result is improved irrigation efficiency, reduced leaching and erosion losses, and conserved energy. This scenario does not include gated pipe or associated practices. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation- Excess nutrients in surface and ground waters, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.

**Before Situation:**

Unacceptable irrigation application uniformity along existing surface irrigation system furrow or border length caused by excessive run length or soil infiltration rate when operated with continuous inflow on existing system. System is over irrigated in attempt to adequately irrigate low end of field.

**After Situation:**

A surge surface irrigation system is in place. After implementation, distribution uniformity and irrigation efficiency is improved, by reducing irrigation application volume and deep percolation losses. Runoff reductions, reduced energy use, and air quality improvements can also result.

**Feature Measure:** Number of Surge Valves

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,229.07

**Scenario Cost/Unit:** $2,229.07

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. | Hour | $24.81 | 2 | $49.62 |
| **Materials** | | | | | | |
| Surge Valve And Controller | 1477 | Surge Valve and Controller, with appurtenances. Material cost includes valve, controller, all appurtenances, and mobilization. | Each | $2,179.45 | 1 | $2,179.45 |

**Practice:** 443 - Irrigation System, Surface and Subsurface

**Scenario** #10 - Aluminum Gated Pipe

**Scenario Description:**

Installation of surface Aluminum gated pipe to efficiently convey and distribute irrigation water in irrigation furrows, borders, or contour levees. A typical scenario would include 1,320 feet of 10-inch Aluminum gated pipe, with 40 inch gate spacing used to irrigate 60 acres. Appurtenances include: gates, couplings, fittings, in-line valves, pressure relief valves, and air vent valves. Does not include flow meters, or a permanent inlet structure with or without filtration. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable Plant productivity and health. Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.,

**Before Situation:**

Typical before situation would include conveyance of water to surface irrigation distribution points with earthen ditches and distribution to individual furrows, borders, or contour levies by siphon tubes. The existing system would experience significant seepage ditch losses, and poor distribution uniformity.

**After Situation:**

The installation will improve distribution uniformity, irrigation efficiency, and eliminate or reduce ditch seepage.

**Feature Measure:** Weight of Pipe

**Scenario Unit::** Pound

**Scenario Typical Size:** 2,442.0

**Scenario Total Cost:** $13,033.46

**Scenario Cost/Unit:** $5.34

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. | Hour | $24.81 | 10 | $248.10 |
| **Materials** | | | | | | |
| Pipe, aluminum, smooth wall, weight priced | 1382 | Aluminum manufactured into smooth wall pipe | Pound | $4.76 | 2686 | $12,785.36 |

**Practice:** 443 - Irrigation System, Surface and Subsurface

**Scenario** #11 - Polyvinyl Chloride (PVC) Gated Pipe

**Scenario Description:**

Installation of surface PVC gated pipe to efficiently convey and distribute irrigation water in irrigation furrows, borders, or contour levees. A typical scenario would include 1,320 feet of 10-inch PVC gated pipe, with 40 inch gate spacing used to irrigate 60 acres. Appurtenances include: gates, couplings, fittings, in-line valves, pressure relief valves, and air vent valves. Does not include flow meters, or a permanent inlet structure with or without filtration. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable Plant productivity and health. Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590 Nutrient Management.,

**Before Situation:**

Typical before situation would include conveyance of water to surface irrigation distribution points with earthen ditches and distribution to individual furrows, borders, or contour levies by siphon tubes. The existing system would experience significant seepage ditch losses, and poor distribution uniformity.

**After Situation:**

The installation will improve distribution uniformity, irrigation efficiency, and eliminate or reduce ditch seepage.

**Feature Measure:** Weight of Pipe

**Scenario Unit::** Pound

**Scenario Typical Size:** 3,320.0

**Scenario Total Cost:** $6,675.62

**Scenario Cost/Unit:** $2.01

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. | Hour | $24.81 | 10 | $248.10 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 3652 | $6,427.52 |

**Practice:** 443 - Irrigation System, Surface and Subsurface

**Scenario** #12 - Poly Irrigation Tubing

**Scenario Description:**

This practice includes installation of thin wall Polyethylene (PE) irrigation tubing with 2½-inch gates, or gated pipe installed in shallow above ground trenches to replace above ground canals used to deliver water to individual basins within a contour levee or basin surface irrigation system. The typical scenario will use 1,320 feet of 15-inch, 10 mil, PE irrigation tubing (a 1,320-foot roll weighs 250 pounds) with 100 2½-inch gates spaced approximately 13 feet apart, installed in shallow above ground trenches to replace above ground canals used to deliver water to individual basins within a 40-acre irrigated field. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation- Excess nutrients in surface and ground waters, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities Associated Practices: 464-Irrigation Land leveling, 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 328-Conservation Crop Rotation, and 590-Nutrient Management.

**Before Situation:**

Typical before situation would include a contour levee or basin surface irrigation system. Irrigation water is delivered to individual basins in a 40-acre rice field split into paddies using irrigation canals and field ditches.

**After Situation:**

After implementation irrigation efficiency is improved, while reducing irrigation application volume, runoff, evaporation losses, and cold water damage to crops. Reduced energy use and air quality improvements can also result.

**Feature Measure:** Weight of Pipe

**Scenario Unit::** Pound

**Scenario Typical Size:** 250.0

**Scenario Total Cost:** $748.10

**Scenario Cost/Unit:** $2.99

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. | Hour | $24.81 | 10 | $248.10 |
| **Materials** | | | | | | |
| Pipe, PE, collapsible, weight priced | 1385 | Polyethylene (PE) compound manufactured into collapsible tubing | Pound | $1.30 | 250 | $325.00 |
| Flap gate, plastic, 2 1/2" | 1424 | 2 1/2" plastic flap gate for poly irrigation tubing. Materials only. | Each | $1.75 | 100 | $175.00 |

**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::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $985.40

**Scenario Cost/Unit:** $32.85

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. | Hour | $49.27 | 20 | $985.40 |

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $887.56

**Scenario Cost/Unit:** $17.75

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. | Hour | $24.81 | 4 | $99.24 |
| 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. | Hour | $49.27 | 16 | $788.32 |

**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 management 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $1,379.76

**Scenario Cost/Unit:** $68.99

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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $285.50 | 1 | $285.50 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $36.74 | 4 | $146.96 |
| **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 | $78.09 | 2 | $156.18 |

**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 management 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,615.54

**Scenario Cost/Unit:** $130.78

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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Data Logger | 1453 | Data Logger W/Graphic Output for water management. Materials only. | Each | $760.64 | 2 | $1,521.28 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $36.74 | 4 | $146.96 |
| **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 | $78.09 | 2 | $156.18 |

**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 annual crops with sprinkler or micro irrigation.

**After Situation:**

Producer uses periodic soil moisture measurements to schedule irrigation more effectively resulting in improved irrigation water management 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $791.12

**Scenario Cost/Unit:** $39.56

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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $49.27 | 8 | $394.16 |

**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 management 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $1,627.86

**Scenario Cost/Unit:** $81.39

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. | Hour | $24.81 | 26 | $645.06 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $285.50 | 1 | $285.50 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $36.74 | 4 | $146.96 |
| **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 | $78.09 | 2 | $156.18 |

**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 management 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,863.64

**Scenario Cost/Unit:** $143.18

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. | Hour | $24.81 | 26 | $645.06 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Data Logger | 1453 | Data Logger W/Graphic Output for water management. Materials only. | Each | $760.64 | 2 | $1,521.28 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $36.74 | 4 | $146.96 |
| **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 | $78.09 | 2 | $156.18 |

**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 management 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $1,039.22

**Scenario Cost/Unit:** $51.96

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. | Hour | $24.81 | 26 | $645.06 |
| 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. | Hour | $49.27 | 8 | $394.16 |

**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 management 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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $944.47

**Scenario Cost/Unit:** $18.89

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. | Hour | $24.81 | 4.75 | $117.85 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $285.50 | 1 | $285.50 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $36.74 | 4 | $146.96 |

**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 management 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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $2,180.25

**Scenario Cost/Unit:** $43.60

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. | Hour | $24.81 | 4.75 | $117.85 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Data Logger | 1453 | Data Logger W/Graphic Output for water management. Materials only. | Each | $760.64 | 2 | $1,521.28 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $36.74 | 4 | $146.96 |

**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 management 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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $512.01

**Scenario Cost/Unit:** $10.24

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. | Hour | $24.81 | 4.75 | $117.85 |
| 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. | Hour | $49.27 | 8 | $394.16 |

**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::** Acre

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $7,381.47

**Scenario Cost/Unit:** $295.26

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. | Hour | $24.81 | 40 | $992.40 |
| 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. | Hour | $104.31 | 20 | $2,086.20 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 | $655.75 | 1 | $655.75 |
| 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 | $1,679.44 | 1 | $1,679.44 |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $285.50 | 1 | $285.50 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $36.74 | 2 | $73.48 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| **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 | $78.09 | 1 | $78.09 |

**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::** Acre

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $1,305.33

**Scenario Cost/Unit:** $52.21

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. | Hour | $24.81 | 40 | $992.40 |
| 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. | Hour | $104.31 | 3 | $312.93 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #1 - Turf Reinforced Matting

**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 Foot

**Scenario Typical Size:** 4,500.0

**Scenario Total Cost:** $4,019.74

**Scenario Cost/Unit:** $0.89

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 Yard | $2.56 | 125 | $320.00 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 0.1 | $1.23 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 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. | Acre | $23.61 | 0.1 | $2.36 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 0.1 | $0.85 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 83 | $81.34 |
| **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. | Hour | $49.27 | 1 | $49.27 |
| **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 | $0.50 | 3 | $1.50 |
| 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 | $0.64 | 6 | $3.84 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 6 | $2.16 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 0.2 | $18.65 |
| Turf reinforcement mat | 1212 | Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor. | Square Yard | $6.12 | 500 | $3,060.00 |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 0.1 | $4.83 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #2 - Rock Lined - 12"

**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 Foot

**Scenario Typical Size:** 4,500.0

**Scenario Total Cost:** $23,002.79

**Scenario Cost/Unit:** $5.11

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 Yard | $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. | Hour | $181.78 | 21 | $3,817.38 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 21 | $2,046.45 |
| **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. | Hour | $24.81 | 21 | $521.01 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 42 | $1,656.06 |
| 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. | Hour | $49.27 | 3 | $147.81 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 100 | $2,155.00 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 312 | $11,453.52 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 468 - Lined Waterway or Outlet

**Scenario** #3 - Rock Lined - 24"

**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 Foot

**Scenario Typical Size:** 4,500.0

**Scenario Total Cost:** $38,907.56

**Scenario Cost/Unit:** $8.65

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 Yard | $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. | Hour | $181.78 | 38 | $6,907.64 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 38 | $3,703.10 |
| **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. | Hour | $24.81 | 38 | $942.78 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 76 | $2,996.68 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 5 | $246.35 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 84 | $1,810.20 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 563 | $20,667.73 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $12,373.22

**Scenario Cost/Unit:** $8.25

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 Yard | $2.56 | 84 | $215.04 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 1 | $97.45 |
| Rock Riprap, grouted | 1757 | Grouted Rock Riprap, placed, includes materials, equipment and labor to transport and place. | Cubic Yard | $144.72 | 70 | $10,130.40 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 1 | $39.43 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 34 | $732.70 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 to 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, terraces, 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 according 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 Foot

**Scenario Typical Size:** 21,780.0

**Scenario Total Cost:** $79,959.29

**Scenario Cost/Unit:** $3.67

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. | Hour | $125.73 | 10 | $1,257.30 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 0.5 | $6.16 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 0.5 | $3.66 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.5 | $11.81 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 0.5 | $4.26 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 806 | $789.88 |
| 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 Yard | $1.76 | 776 | $1,365.76 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 940 | $75,312.80 |
| 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 | $0.50 | 15 | $7.50 |
| 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 | $0.64 | 30 | $19.20 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 30 | $10.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 1 | $93.23 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 0.5 | $24.17 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $526.63

**Scenario Cost/Unit:** $526.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 3 | $72.24 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 8.5 | $141.53 |
| **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. | Hour | $24.81 | 5 | $124.05 |
| **Materials** | | | | | | |
| Post, Wood, CCA treated, 5" x 8' | 11 | Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only. | Each | $11.26 | 2 | $22.52 |
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 1 | $166.29 |

**Practice:** 484 - Mulching

**Scenario** #1 - Natural Material - Full Coverage

**Scenario Description:**

Application of straw mulch or 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $593.01

**Scenario Cost/Unit:** $593.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $128.33 | 2.5 | $320.83 |

**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 Foot

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $921.28

**Scenario Cost/Unit:** $0.18

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. | Hour | $24.81 | 8 | $198.48 |
| **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 | $1.30 | 556 | $722.80 |

**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:** 100.0

**Scenario Total Cost:** $277.00

**Scenario Cost/Unit:** $2.77

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 | $2.77 | 100 | $277.00 |

**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 Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $296.49

**Scenario Cost/Unit:** $0.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yard | $24.76 | 10 | $247.60 |
| **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. | Hour | $24.81 | 1 | $24.81 |

**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 degradation - 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 occurring in areas where the soil was severely disturbed exposing 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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $12,016.30

**Scenario Cost/Unit:** $300.41

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. | Acre | $243.12 | 24 | $5,834.88 |
| 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. | Acre | $210.37 | 24 | $5,048.88 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **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 | $539.90 | 1 | $539.90 |

**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 degradation - 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,004.86

**Scenario Cost/Unit:** $100.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 10 | $573.80 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 20 | $367.00 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 10 | $251.80 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $8,793.26

**Scenario Cost/Unit:** $219.83

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. | Hour | $71.74 | 20 | $1,434.80 |
| Chemical, ground application, wildland | 1313 | Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs. | Acre | $129.26 | 40 | $5,170.40 |
| **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. | Hour | $49.27 | 20 | $985.40 |
| **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. | Acre | $17.48 | 40 | $699.20 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 4 | $169.48 |
| 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 shi | Acre | $1.28 | 40 | $51.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 490 - Tree/Shrub Site Preparation

**Scenario** #4 - Chemical, Aerial Application

**Scenario Description:**

This practice involves the use of herbicides applied by helicopter in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. This typical scenario 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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,028.00

**Scenario Cost/Unit:** $50.70

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. | Acre | $31.94 | 40 | $1,277.60 |
| **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. | Acre | $17.48 | 40 | $699.20 |
| 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 shi | Acre | $1.28 | 40 | $51.20 |

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $5,105.92

**Scenario Cost/Unit:** $127.65

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. | Hour | $71.74 | 40 | $2,869.60 |
| **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. | Hour | $49.27 | 20 | $985.40 |
| **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. | Acre | $26.28 | 40 | $1,051.20 |
| 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. | Acre | $37.13 | 4 | $148.52 |
| 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 shi | Acre | $1.28 | 40 | $51.20 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,547.03

**Scenario Cost/Unit:** $254.70

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. | Hour | $24.81 | 55 | $1,364.55 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 24 | $1,182.48 |

**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 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/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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $400.85

**Scenario Cost/Unit:** $400.85

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. | Acre | $12.32 | 1.5 | $18.48 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1.5 | $10.17 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| **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. | Acre | $7.77 | 1.5 | $11.66 |
| 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. | Acre | $17.48 | 1.5 | $26.22 |
| 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 shi | Acre | $1.28 | 1.5 | $1.92 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 500 - Obstruction Removal

**Scenario** #1 - Removal and Disposal of Brush and Trees < 6 inch Diameter

**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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $2,514.46

**Scenario Cost/Unit:** $1,257.23

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. | Hour | $137.09 | 8 | $1,096.72 |
| Brush Chipper, 6" capacity | 938 | Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hour | $23.48 | 8 | $187.84 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 500 - Obstruction Removal

**Scenario** #2 - Removal and Disposal of Brush and Trees > 6 inch Diameter

**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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $5,031.72

**Scenario Cost/Unit:** $2,515.86

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. | Hour | $214.60 | 12 | $2,575.20 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 12 | $288.96 |
| Brush Chipper, 15" capacity | 1868 | Brush Chipper, 15" capacity, typically 165 HP. Includes chipper and power unit. Does not include labor. | Hour | $72.07 | 12 | $864.84 |
| **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. | Hour | $44.32 | 12 | $531.84 |
| 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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |

**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 occurred 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,020.66

**Scenario Cost/Unit:** $1,020.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 6 | $28.98 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 6 | $144.48 |
| Brush Chipper, 15" capacity | 1868 | Brush Chipper, 15" capacity, typically 165 HP. Includes chipper and power unit. Does not include labor. | Hour | $72.07 | 6 | $432.42 |
| **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. | Hour | $44.32 | 6 | $265.92 |
| 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. | Hour | $24.81 | 6 | $148.86 |

**Practice:** 500 - Obstruction Removal

**Scenario** #4 - Removal and Disposal of Fence

**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::** Foot

**Scenario Typical Size:** 2,640.0

**Scenario Total Cost:** $2,750.18

**Scenario Cost/Unit:** $1.04

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. | Hour | $49.30 | 20 | $986.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 20 | $481.60 |
| **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. | Hour | $24.81 | 20 | $496.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 20 | $503.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 excavation 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 Yard

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $21,921.68

**Scenario Cost/Unit:** $43.84

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 48 | $4,677.60 |
| 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 Yard | $13.61 | 500 | $6,805.00 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hour | $134.46 | 40 | $5,378.40 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $24.81 | 40 | $992.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 40 | $1,007.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 48 | $1,892.64 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 application 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 mounted 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 Yard

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $2,448.78

**Scenario Cost/Unit:** $48.98

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. | Hour | $125.73 | 6 | $754.38 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | $8.08 | 6 | $48.48 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 2 | $194.90 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 2 | $213.82 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 500 - Obstruction Removal

**Scenario** #7 - Removal and Disposal of Steel and or Concrete Structures

**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 Storage Facility (313), Heavy use area protection (561), Underground outlet (620), Structure 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 is removed to install and underground 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 Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $10,760.58

**Scenario Cost/Unit:** $5.38

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. | Hour | $69.35 | 24 | $1,664.40 |
| Auger, Post driver attachment | 934 | Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included. | Hour | $8.08 | 24 | $193.92 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 24 | $2,338.80 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hour | $134.46 | 24 | $3,227.04 |
| **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. | Hour | $24.81 | 24 | $595.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 48 | $1,892.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

**Practice:** 500 - Obstruction Removal

**Scenario** #8 - Removal and Disposal of Wood Structures

**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 remediation of the old dirt floor. Materials are systematically removed and salvaged 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 dirt floor to be remediated under a separate practice.

**Feature Measure:** Building footprint

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 32,000.0

**Scenario Total Cost:** $29,580.71

**Scenario Cost/Unit:** $0.92

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. | Hour | $69.35 | 64 | $4,438.40 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 64 | $3,155.20 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 64 | $309.12 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hour | $134.46 | 24 | $3,227.04 |
| Tub Grinder, 350 HP | 1404 | TUB grinder-350 HP, 10'6" diameter tub opening, 8' diameter inside base. Includes equipment cost only. | Hour | $266.20 | 32 | $8,518.40 |
| **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. | Hour | $24.81 | 128 | $3,175.68 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 88 | $2,215.84 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 96 | $3,785.28 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 500 - Obstruction Removal

**Scenario** #23 - Removal and Disposal of Steel and or Concrete Structures

**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 Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $33,834.64

**Scenario Cost/Unit:** $16.92

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. | Hour | $214.60 | 64 | $13,734.40 |
| 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. | Hour | $69.35 | 64 | $4,438.40 |
| Truck, dump, 18 CY | 1400 | Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only. | Hour | $134.46 | 64 | $8,605.44 |
| **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. | Hour | $44.32 | 65 | $2,880.80 |
| 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. | Hour | $24.81 | 65 | $1,612.65 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 65 | $2,562.95 |

**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::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $366.08

**Scenario Cost/Unit:** $12.20

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 | $63.92 | 1 | $63.92 |
| **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. | Hour | $44.32 | 1 | $44.32 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 2 | $49.22 |

**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::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $366.08

**Scenario Cost/Unit:** $12.20

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 | $63.92 | 1 | $63.92 |
| **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. | Hour | $44.32 | 1 | $44.32 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 2 | $49.22 |

**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 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $1,006.61

**Scenario Cost/Unit:** $50.33

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 | $63.92 | 1 | $63.92 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 51 | $849.15 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 1 | $44.32 |
| **Materials** | | | | | | |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 2 | $49.22 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 512 - Forage and Biomass 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 Forage and Biomass Planti

**Scenario Unit::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $11,200.64

**Scenario Cost/Unit:** $373.35

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. | Acre | $12.32 | 30 | $369.60 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 30 | $203.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 30 | $219.30 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 30 | $708.30 |
| **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 | $0.64 | 1500 | $960.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 1500 | $540.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 60 | $5,593.80 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| 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. | Acre | $17.48 | 30 | $524.40 |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 30 | $2,071.80 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 512 - Forage and Biomass 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 undesirable 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 Forage and Biomass Planti

**Scenario Unit::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $11,299.04

**Scenario Cost/Unit:** $376.63

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. | Acre | $12.32 | 30 | $369.60 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 30 | $203.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 30 | $219.30 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 30 | $708.30 |
| **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 | $0.60 | 1200 | $720.00 |
| 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 | $0.64 | 1500 | $960.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 1500 | $540.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 60 | $5,593.80 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| 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. | Acre | $17.48 | 30 | $524.40 |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 30 | $1,450.20 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 512 - Forage and Biomass 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 undesirable 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 Forage and Biomass Planti

**Scenario Unit::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $15,583.64

**Scenario Cost/Unit:** $519.45

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. | Acre | $12.32 | 30 | $369.60 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 30 | $203.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 30 | $219.30 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 30 | $708.30 |
| **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 | $0.64 | 1500 | $960.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 1500 | $540.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 60 | $5,593.80 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| 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. | Acre | $17.48 | 30 | $524.40 |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 30 | $6,454.80 |

**Practice:** 512 - Forage and Biomass 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 undesirable 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 Forage and Biomass Planti

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,264.94

**Scenario Cost/Unit:** $326.49

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. | Acre | $12.32 | 10 | $123.20 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 10 | $73.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| **Materials** | | | | | | |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 20 | $1,864.60 |
| Nitrogen, Organic | 266 | ORGANIC Nitrogen | Pound | $0.20 | 400 | $80.00 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.20 | 500 | $100.00 |
| Potassium, Organic | 268 | ORGANIC Potassium | Pound | $0.20 | 500 | $100.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes | 2340 | Certified organic cool season perennial grass and legume mix. Includes material and shipping only. | Acre | $67.79 | 10 | $677.90 |

**Practice:** 512 - Forage and Biomass 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 Forage and Biomass Planti

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,074.44

**Scenario Cost/Unit:** $307.44

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. | Acre | $7.31 | 10 | $73.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| **Materials** | | | | | | |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 20 | $1,864.60 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.20 | 500 | $100.00 |
| Potassium, Organic | 268 | ORGANIC Potassium | Pound | $0.20 | 500 | $100.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| Untreated Conventional Seed, One Species, Warm Season, Native Perennial Grass | 2341 | Untreated conventional native, warm season perennial grass. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $69.06 | 10 | $690.60 |

**Practice:** 512 - Forage and Biomass 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 Forage and Biomass Planti

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,138.34

**Scenario Cost/Unit:** $513.83

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. | Acre | $7.31 | 10 | $73.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| **Materials** | | | | | | |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 20 | $1,864.60 |
| Phosphorus, Organic | 267 | ORGANIC Phosphorus | Pound | $0.20 | 500 | $100.00 |
| Potassium, Organic | 268 | ORGANIC Potassium | Pound | $0.20 | 500 | $100.00 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| Untreated Conventional Seed, Three plus Species Mix, Warm Season Perennial Grass | 2344 | Untreated conventional wWarm season perennial grass mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $275.45 | 10 | $2,754.50 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 512 - Forage and Biomass 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 quantity, 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::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $9,486.89

**Scenario Cost/Unit:** $316.23

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. | Acre | $6.78 | 30 | $203.40 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 30 | $219.30 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $11.75 | 30 | $352.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 30 | $708.30 |
| **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 | $0.60 | 1200 | $720.00 |
| 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 | $0.64 | 1500 | $960.00 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 1500 | $540.00 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 45 | $4,195.35 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| 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. | Acre | $17.48 | 30 | $524.40 |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 20 | $1,053.60 |

**Practice:** 512 - Forage and Biomass 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 quantity, 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 Forage and Biomass Planti

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $585.09

**Scenario Cost/Unit:** $58.51

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. | Acre | $23.61 | 10 | $236.10 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| Certified Organic, Three Species Mix, Cool Season, Perennial Grasses and Legumes | 2340 | Certified organic cool season perennial grass and legume mix. Includes material and shipping only. | Acre | $67.79 | 5 | $338.95 |

**Practice:** 512 - Forage and Biomass 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 quantity, 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 Forage and Biomass Planti

**Scenario Unit::** Acre

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $2,499.74

**Scenario Cost/Unit:** $83.32

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. | Acre | $6.78 | 30 | $203.40 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 30 | $708.30 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| 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. | Acre | $17.48 | 30 | $524.40 |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 20 | $1,053.60 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $3,048.85

**Scenario Cost/Unit:** $3.05

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") | Foot | $1.24 | 1000 | $1,240.00 |
| **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. | Hour | $24.81 | 9 | $223.29 |
| **Materials** | | | | | | |
| Pipe, PVC, 1 1/2", SCH 40 | 975 | Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785 | Foot | $1.02 | 1000 | $1,020.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $6,122.13

**Scenario Cost/Unit:** $6.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 1000 | $1,500.00 |
| **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. | Hour | $24.81 | 9 | $223.29 |
| **Materials** | | | | | | |
| Pipe, PVC, dia. < 18", weight priced | 1323 | Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only. | Pound | $1.76 | 2178 | $3,833.28 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $1,018.48

**Scenario Cost/Unit:** $1.02

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. | Hour | $24.81 | 8 | $198.48 |
| **Materials** | | | | | | |
| Pipe, PE, 1 1/4", DR 9 | 998 | Materials: - 1 1/4" - PE - 160 psi - ASTM D3035 DR 9 | Foot | $0.82 | 1000 | $820.00 |

**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::** Foot

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $11,669.16

**Scenario Cost/Unit:** $116.69

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. | Hour | $61.96 | 8 | $495.68 |
| Horizontal Boring, Greater Than 3" diameter | 1132 | Includes equipment, labor and setup. | Foot | $94.86 | 100 | $9,486.00 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| **Materials** | | | | | | |
| Pipe, PE, 4", DR 9 | 1002 | Materials: - 4" - PE - 160 psi - ASTM D3035 DR 9 | Foot | $6.08 | 100 | $608.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 521A - Pond Sealing or Lining, Flexible Membrane

**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 Foot

**Scenario Typical Size:** 21,700.0

**Scenario Total Cost:** $37,541.10

**Scenario Cost/Unit:** $1.73

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 | $2.77 | 2420 | $6,703.40 |
| 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. | Hour | $69.35 | 8 | $554.80 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 32 | $1,577.60 |
| 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. | Hour | $61.27 | 4 | $245.08 |
| 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. | Hour | $103.55 | 4 | $414.20 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 40 | $1,007.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| 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. | Hour | $104.31 | 64 | $6,675.84 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 45 | $1,387.80 |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 300 | $1,047.00 |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $6.39 | 2420 | $15,463.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 521A - Pond Sealing or Lining, Flexible Membrane

**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 Foot

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $5,908.04

**Scenario Cost/Unit:** $2.36

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 | $2.77 | 102 | $282.54 |
| 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. | Hour | $69.35 | 4 | $277.40 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 16 | $788.80 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34" roller. Equipment cost only. Does not include labor. | Hour | $15.27 | 2 | $30.54 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 8 | $354.56 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 18 | $453.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| 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. | Hour | $104.31 | 16 | $1,668.96 |
| **Materials** | | | | | | |
| Synthetic Liner, 40 mil | 1387 | Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only. | Square Yard | $6.39 | 102 | $651.78 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 521C - Pond Sealing or Lining, Bentonite Sealant

**Scenario** #1 - Bentonite Treatment, Uncovered

**Scenario Description:**

A compacted soil liner treated with bentonite is constructed to reduce seepage from ponds or waste storage impoundment structures. Bentonite is incorporated with the soil under proper moisture conditions and compacted to designed liner thickness. Bentonite treated soil liner may require additional filter compatibility requirements with the subgrade (graded filter or geotextile) as described in the NRCS, National Engineering Handbook. Associated practices: Waste Storage Facility (313), Pond (378)

**Before Situation:**

Soils on-site exhibit seepage rates in excess of acceptable limits and are suitable for treatment with dispersants. 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 compacted soil liner treated with bentonite is constructed to reduce seepage from ponds or waste storage impoundment structures. The liner is constructed 1 foot thick over a 1 acre area. The liner reduces or prevents seepage losses, which reduces the delivery of nutrients and pathogens to surface water.

**Feature Measure:** Volume of Liner Material

**Scenario Unit::** Cubic Yard

**Scenario Typical Size:** 1,613.0

**Scenario Total Cost:** $128,875.14

**Scenario Cost/Unit:** $79.90

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 Yard | $4.83 | 1613 | $7,790.79 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 6 | $382.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 6 | $151.08 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $22.95 | 5227 | $119,959.65 |
| **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 i | Dollar | $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 | $282.78 | 1 | $282.78 |

**Practice:** 521C - Pond Sealing or Lining, Bentonite Sealant

**Scenario** #2 - Bentonite Treatment, Covered

**Scenario Description:**

A compacted soil liner treated with bentonite is constructed to reduce seepage from ponds or waste storage impoundment structures. Bentonite is incorporated with the soil under proper moisture conditions and compacted to designed liner thickness. A soil cover is placed over the treated liner. Payment is based on the volume of liner material and the cost of soil cover is included in the payment. Bentonite treated soil liner may require additional filter compatibility requirements with the subgrade (graded filter or geotextile) as described in the NRCS, National Engineering Handbook. implementation may require filter compatibility with the subgrade (graded filter or geotextile). Associated practices: Waste Storage Facility (313), Pond (378)

**Before Situation:**

Soils on-site exhibit seepage rates in excess of acceptable limits and are suitable for treatment with dispersants. 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 compacted soil liner treated with bentonite is constructed to reduce seepage from ponds or waste storage impoundment structures. The liner is constructed 1 foot thick over a 1 acre area. A 1 foot soil cover is placed over the treated liner. The cost of installing the 1 foot cover is included in the payment of the treated material. The liner reduces or prevents seepage losses, which reduces the delivery of nutrients and pathogens to surface water.

**Feature Measure:** Volume of Liner Material (includes

**Scenario Unit::** Cubic Yard

**Scenario Typical Size:** 1,613.0

**Scenario Total Cost:** $136,670.76

**Scenario Cost/Unit:** $84.73

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 Yard | $4.83 | 3227 | $15,586.41 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 6 | $382.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 6 | $151.08 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Bentonite | 41 | Bentonite, includes materials (50# bag) | Each | $22.95 | 5227 | $119,959.65 |
| **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 i | Dollar | $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 | $282.78 | 1 | $282.78 |

**Practice:** 521D - Pond Sealing or Lining, Compacted Clay Treatment

**Scenario** #1 - Material haul < 2000 ft

**Scenario Description:**

A compacted soil liner treated with compacted clay is constructed to reduce seepage from ponds or waste storage impoundment structures. Material is hauled from less than 1 mile away from site. 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. Associated practices: Pond (378), Waste Storage Facility (313), and other waste impoundments

**Before Situation:**

Soils on-site exhibit seepage rates in excess of acceptable limits. An adequate supply of soil suitable for constructing a clay liner without amendments is available at an economical haul distance within 1 mile of the site.

**After Situation:**

A 12” thick compacted clay liner with 6” thick of soil cover is installed over 1 acre. Water conservation and environmental protection are provided by limiting seepage losses from ponds or waste storage impoundments.

**Feature Measure:** Volume of Liner Material (including

**Scenario Unit::** Cubic Yard

**Scenario Typical Size:** 2,420.0

**Scenario Total Cost:** $29,291.44

**Scenario Cost/Unit:** $12.10

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 Yard | $4.83 | 2420 | $11,688.60 |
| Excavation, clay, large equipment, 50 ft | 1218 | Bulk excavation of clay with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | $2.96 | 1613 | $4,774.48 |
| 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 Yard | $4.17 | 2420 | $10,091.40 |
| **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. | Hour | $104.31 | 8 | $834.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 3 | $1,619.70 |

**Practice:** 521D - Pond Sealing or Lining, Compacted Clay Treatment

**Scenario** #2 - Material haul > 2000 feet

**Scenario Description:**

A compacted soil liner treated with compacted clay is constructed to reduce seepage from ponds or waste storage impoundment structures. Material is hauled from over 1 mile away from site. 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. Associated practices: Pond (378), Waste Storage Facility (313), and other waste impoundments

**Before Situation:**

Soils on-site exhibit seepage rates in excess of acceptable limits. An adequate supply of soil suitable for constructing a clay liner without amendments is available at an economical haul distance over 1 mile from the site.

**After Situation:**

A 12” thick compacted clay liner with 6” thick of soil cover is installed over 1 acre. Water conservation and environmental protection are provided by limiting seepage losses from ponds or waste storage impoundments. The typical haul distance is 3.3 miles.

**Feature Measure:** Volume of Liner Material (including

**Scenario Unit::** Cubic Yard

**Scenario Typical Size:** 2,420.0

**Scenario Total Cost:** $38,470.69

**Scenario Cost/Unit:** $15.90

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 Yard | $2.56 | 2420 | $6,195.20 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 2420 | $11,688.60 |
| Excavation, clay, large equipment, 50 ft | 1218 | Bulk excavation of clay with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor. | Cubic Yard | $2.96 | 1613 | $4,774.48 |
| 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 Yard | $4.17 | 2420 | $10,091.40 |
| 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 | $0.37 | 8065 | $2,984.05 |
| **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. | Hour | $104.31 | 8 | $834.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 3 | $1,619.70 |

**Practice:** 527 - Karst 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::** Foot

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $9,755.83

**Scenario Cost/Unit:** $390.23

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 Yard | $502.23 | 6 | $3,013.38 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 80 | $221.60 |
| 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 Yard | $2.56 | 95 | $243.20 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 50 | $198.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 4 | $292.40 |
| 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. | Hour | $125.73 | 8 | $1,005.84 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 30 | $937.50 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 15 | $550.65 |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $128.33 | 10 | $1,283.30 |
| Pipe, PVC, Schedule 80, Perforated | 1408 | Materials: 12" Diameter schedule 80 perforated pvc pipe - ASTM D1785 | Foot | $43.60 | 20 | $872.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 527 - Karst 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 Yard

**Scenario Typical Size:** 75.0

**Scenario Total Cost:** $9,953.20

**Scenario Cost/Unit:** $132.71

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 | $2.77 | 220 | $609.40 |
| 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 Yard | $2.56 | 75 | $192.00 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 110 | $435.60 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 16 | $1,169.60 |
| 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. | Hour | $181.78 | 16 | $2,908.48 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 32 | $1,261.76 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 38 | $1,187.50 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 18 | $660.78 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 527 - Karst 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 percolation 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 separate practice.

**Feature Measure:** Surface area of sinkhole

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 706.0

**Scenario Total Cost:** $6,973.94

**Scenario Cost/Unit:** $9.88

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 | $2.77 | 220 | $609.40 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 70 | $277.20 |
| 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. | Hour | $125.73 | 8 | $1,005.84 |
| 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. | Hour | $125.73 | 8 | $1,005.84 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 52 | $1,625.00 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 36 | $1,321.56 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 527 - Karst 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 Yard

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $10,705.86

**Scenario Cost/Unit:** $713.72

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 Yard | $502.23 | 14 | $7,031.22 |
| 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 Yard | $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. | Hour | $125.73 | 8 | $1,005.84 |
| 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. | Hour | $125.73 | 8 | $1,005.84 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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), Access 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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $1,429.31

**Scenario Cost/Unit:** $35.73

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 | $63.92 | 1 | $63.92 |
| **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 | $50.23 | 1 | $50.23 |
| **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. | Hour | $44.32 | 14 | $620.48 |
| 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. | Hour | $24.81 | 28 | $694.68 |

**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), Access 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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $2,823.64

**Scenario Cost/Unit:** $70.59

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 18 | $562.68 |
| 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 | $50.23 | 1 | $50.23 |
| **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. | Hour | $24.81 | 45 | $1,116.45 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Nutritional Balance Analyzer, fecal sample analysis only | 1127 | NIRS fecal analysis, animal performance report. Includes materials and shipping only. | Each | $40.34 | 6 | $242.04 |

**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), Access 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $994.53

**Scenario Cost/Unit:** $49.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| Trucking, moving livestock to new paddock | 961 | Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6'8" x 24'. Includes equipment, power unit and labor costs. | Mile | $5.35 | 5 | $26.75 |
| 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 | $50.23 | 1 | $50.23 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 51 | $849.15 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 1 | $44.32 |

**Practice:** 528 - Prescribed Grazing

**Scenario** #4 - Targeted Grazing

**Scenario Description:**

Management of woody non-herbaceous plant species through the use of livestock that are closely herded to concentrate grazing on targeted shrubs. Animals graze for up to 21 days. Grazing may be repeated in subsequent years as needed. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have dense stands of woody non-herbaceous species that exceed the desirable ecological site condition. This scenario is an alternative for organic producers. Associated Practices: Early Successional Habitat Development and Management (647), Restoration of Rare and Declining Habitats (643), Shallow Water Development and Management (646), Wetland Wildlife Habitat Management (644)

**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 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, hydrology and plant health and vigor is returning to near normal levels.

**Feature Measure:** Area treated

**Scenario Unit::** Acre

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $1,922.28

**Scenario Cost/Unit:** $384.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 3 | $93.78 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| **Materials** | | | | | | |
| Animals used for biological weed control | 1130 | Goats, Llamas, Sheep - Includes all support: fence, water, dog, mob, etc. Includes materials and shipping only. | Head per day | $13.17 | 120 | $1,580.40 |

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,837.27

**Scenario Cost/Unit:** $1,837.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 6 | $144.48 |
| **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. | Hour | $44.32 | 6 | $265.92 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **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 a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will | Each | $549.88 | 1 | $549.88 |
| 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. The completed pump and moto | Horsepower | $413.86 | 2 | $827.72 |

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,726.74

**Scenario Cost/Unit:** $2,726.74

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 Yard | $322.92 | 0.25 | $80.73 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| **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. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 0.25 | $7.81 |
| Pipe, PE, 1 1/4", DR 9 | 998 | Materials: - 1 1/4" - PE - 160 psi - ASTM D3035 DR 9 | Foot | $0.82 | 10 | $8.20 |
| 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 a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will | Each | $549.88 | 1 | $549.88 |
| 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. The completed pump and moto | Horsepower | $413.86 | 2 | $827.72 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $463.67 | 1 | $463.67 |

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,855.67

**Scenario Cost/Unit:** $3,855.67

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 Yard | $322.92 | 0.5 | $161.46 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **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 dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and | Each | $1,968.95 | 1 | $1,968.95 |
| 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 | Horsepower | $125.33 | 7.5 | $939.98 |

**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 irrigation 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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,884.24

**Scenario Cost/Unit:** $8,884.24

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 Yard | $322.92 | 2 | $645.84 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| **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. | Hour | $44.32 | 4 | $177.28 |
| 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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **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 dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and | Each | $1,968.95 | 1 | $1,968.95 |
| 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 | Horsepower | $125.33 | 25 | $3,133.25 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $19,224.98

**Scenario Cost/Unit:** $19,224.98

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 Yard | $322.92 | 2 | $645.84 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 56 | $1,348.48 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $24.81 | 56 | $1,389.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 56 | $2,759.12 |
| **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 dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and | Each | $4,657.54 | 1 | $4,657.54 |
| 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. IIncludes material and shipping | Horsepower | $95.62 | 70 | $6,693.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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:** 50.0

**Scenario Total Cost:** $12,179.50

**Scenario Cost/Unit:** $243.59

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 | $243.59 | 50 | $12,179.50 |

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,502.51

**Scenario Cost/Unit:** $3,502.51

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 Yard | $322.92 | 0.25 | $80.73 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Pump, < 50 HP, Pump & ICE power unit | 1027 | Materials, labor, controls: < 50 HP Pump & ICE power unit | Horsepower | $615.46 | 5 | $3,077.30 |

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $9,887.32

**Scenario Cost/Unit:** $9,887.32

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 Yard | $322.92 | 1 | $322.92 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Pump, < 50 HP, Pump & ICE power unit | 1027 | Materials, labor, controls: < 50 HP Pump & ICE power unit | Horsepower | $615.46 | 10 | $6,154.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $30,322.22

**Scenario Cost/Unit:** $30,322.22

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 Yard | $322.92 | 1 | $322.92 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Pump, > 70 HP, Pump & ICE power unit | 1029 | Materials, labor, controls: > 70 HP Pump & ICE power unit | Horsepower | $374.50 | 71 | $26,589.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $42,344.92

**Scenario Cost/Unit:** $42,344.92

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 Yard | $322.92 | 2 | $645.84 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 6 | $144.48 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $24.81 | 48 | $1,190.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Pump, > 70 HP, Pump & ICE power unit | 1029 | Materials, labor, controls: > 70 HP Pump & ICE power unit | Horsepower | $374.50 | 100 | $37,450.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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:** 1.0

**Scenario Total Cost:** $10,856.90

**Scenario Cost/Unit:** $10,856.90

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 Yard | $322.92 | 2 | $645.84 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| Aerial lift, telescoping bucket | 1893 | Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only. | Hour | $46.63 | 8 | $373.04 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Windmill, 10', fan diameter | 1036 | Includes materials costs for windmill head and 27??? tower | Each | $7,593.90 | 1 | $7,593.90 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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:** 1.0

**Scenario Total Cost:** $7,241.62

**Scenario Cost/Unit:** $7,241.62

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Pipe, PE, 1 1/4", DR 9 | 998 | Materials: - 1 1/4" - PE - 160 psi - ASTM D3035 DR 9 | Foot | $0.82 | 250 | $205.00 |
| 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 tot | Each | $2,896.94 | 1 | $2,896.94 |
| 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 inc | Kilowatt | $5,752.56 | 0.6 | $3,451.54 |

**Practice:** 533 - Pumping Plant

**Scenario** #13 - Water Ram Pump

**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:** 1.0

**Scenario Total Cost:** $1,558.80

**Scenario Cost/Unit:** $1,558.80

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 Yard | $322.92 | 0.5 | $161.46 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Pipe, PE, 1 1/4", DR 9 | 998 | Materials: - 1 1/4" - PE - 160 psi - ASTM D3035 DR 9 | Foot | $0.82 | 50 | $41.00 |
| Pump, Ram | 1114 | Ram pump kit, 2 inch. Includes materials and shipping only. | Each | $571.06 | 1 | $571.06 |

**Practice:** 533 - Pumping Plant

**Scenario** #14 - Livestock Nose Pump

**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:** 1.0

**Scenario Total Cost:** $525.73

**Scenario Cost/Unit:** $525.73

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. | Hour | $44.32 | 1 | $44.32 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1.2 | $37.50 |
| Pipe, PE, 1 1/4", DR 9 | 998 | Materials: - 1 1/4" - PE - 160 psi - ASTM D3035 DR 9 | Foot | $0.82 | 25 | $20.50 |
| Nose Pump | 1052 | Materials and delivery. | Each | $374.14 | 1 | $374.14 |

**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:** 1.0

**Scenario Total Cost:** $9,809.35

**Scenario Cost/Unit:** $9,809.35

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. | Hour | $49.27 | 1 | $49.27 |
| 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. | Hour | $104.31 | 6 | $625.86 |
| **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 dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and | Each | $1,968.95 | 2 | $3,937.90 |
| 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 | Horsepower | $125.33 | 20 | $2,506.60 |
| 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 | $2,689.72 | 1 | $2,689.72 |

**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 required. 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:** 1.0

**Scenario Total Cost:** $36,209.19

**Scenario Cost/Unit:** $36,209.19

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 Yard | $322.92 | 1.5 | $484.38 |
| 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 Yard | $502.23 | 4 | $2,008.92 |
| 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. | Hour | $125.73 | 8 | $1,005.84 |
| 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 | Hour | $182.75 | 2 | $365.50 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1.5 | $46.88 |
| Swing Check Valve, metal, 12" | 2082 | 12" swing check valve for back flow prevention, ductile iron metal body with flange mount and lever shaft. Materials only. | Each | $3,532.25 | 1 | $3,532.25 |
| Pump, Manure, Solid Piston | 2157 | Pump, Manure, Solid Piston, Hydraulically Actuated, 12" or greater discharge, 7.5 HP w/ accessories. Includes delivery. | Each | $27,503.10 | 1 | $27,503.10 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

**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:** 1.0

**Scenario Total Cost:** $783.52

**Scenario Cost/Unit:** $783.52

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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Pump, Ag Water PTO, 22 GPM | 1115 | Ag Water PTO Pump, 22 GPM, 1" diameter. Includes materials, labor, controls and shipping. | Each | $630.90 | 1 | $630.90 |
| Aggregate, gravel, washed, pea gravel | 1331 | Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry. | Cubic Yard | $34.45 | 3 | $103.35 |

**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:** 1.0

**Scenario Total Cost:** $4,069.79

**Scenario Cost/Unit:** $4,069.79

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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 3 | $93.75 |
| Pump, Ag Water PTO, 300 GPM | 1116 | Ag water PTO Pump, 300 GPM, 3" diameter. Includes materials, labor, controls and shipping. | Each | $3,926.77 | 1 | $3,926.77 |

**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:** 1.0

**Scenario Total Cost:** $9,703.52

**Scenario Cost/Unit:** $9,703.52

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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 2.5 | $53.88 |
| Pump, Ag Water PTO, 1,000 GPM | 1923 | Materials, labor, controls: Ag Water PTO Pump 1,000 GPM - 8" | Each | $9,600.37 | 1 | $9,600.37 |

**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:** 1.0

**Scenario Total Cost:** $1,170.05

**Scenario Cost/Unit:** $1,170.05

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **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. | Hour | $44.32 | 3 | $132.96 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **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 a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will | Each | $549.88 | 1 | $549.88 |
| 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. The completed pump and moto | Horsepower | $413.86 | 1 | $413.86 |

**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:** 1.0

**Scenario Total Cost:** $12,201.44

**Scenario Cost/Unit:** $12,201.44

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 | $9,100.44 | 1 | $9,100.44 |
| 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. | Gallon per Minute | $4.43 | 700 | $3,101.00 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Matches need

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $6,955.49

**Scenario Cost/Unit:** $6,955.49

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. | Hour | $61.96 | 8 | $495.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| Crane, truck mounted, hydraulic, 12 ton | 1734 | 12 ton capacity truck mounted hydraulic crane. Equipment cost only. | Hour | $101.16 | 4 | $404.64 |
| **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. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1 | $31.25 |
| Pipe, PE, 1 1/4", DR 9 | 998 | Materials: - 1 1/4" - PE - 160 psi - ASTM D3035 DR 9 | Foot | $0.82 | 20 | $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 a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will | Each | $549.88 | 1 | $549.88 |
| 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. The completed pump and moto | Horsepower | $413.86 | 2 | $827.72 |
| Pressure Tank, 40 gallon | 1038 | Pressure Tank, 40 gallon. Includes materials and shipping only. | Each | $463.67 | 1 | $463.67 |
| Pumping Plant Pit, Concrete, 1200 Gallon | 1922 | Precast concrete septic tank structure, 1200 gal capacity, with access port and ladder. Materials only. | Each | $1,414.05 | 1 | $1,414.05 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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:** 1.0

**Scenario Total Cost:** $13,605.86

**Scenario Cost/Unit:** $13,605.86

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 Yard | $322.92 | 2 | $645.84 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 4 | $177.28 |
| 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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **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 dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and | Each | $4,657.54 | 1 | $4,657.54 |
| 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. IIncludes material and shipping | Horsepower | $95.62 | 50 | $4,781.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 533 - Pumping Plant

**Scenario** #64 - Booster Pump for Waste Transfer

**Scenario Description:**

Installation of Booster Pump along Waste Transfer System to move to distant fields for application.

**Before Situation:**

Waste is currently applied by tanker or if pumped to field, cannot be pumped efficiently from storage to required distance for proper field application. Application by tanker is energy inefficient, causes excessive soil compaction, and limits application timing and methods for environmentally safe application of waste.

**After Situation:**

Booster pump allows transfer of waste to more distant fields eliminating the need for tanker application. Reduces soil compaction, increases energy efficiency, and increases nutrient use efficiency reducing the potential for nutrient runoff and leaching.

**Feature Measure:** Booster Pump

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $11,207.18

**Scenario Cost/Unit:** $11,207.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Materials** | | | | | | |
| Booster Pump for Hard Hose Reel Traveler, 4" dia. Hose | 2443 | Booster pump for a hard hose reel traveler, 4 inch diameter hose approximately 1/4 mile long. Includes booster pump only. | Each | $11,207.18 | 1 | $11,207.18 |

## USDA - Natural Resources Conservation Service

**New York**

**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 restrictive 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 treatment

**Scenario Unit::** Acre

**Scenario Typical Size:** 25.0

**Scenario Total Cost:** $932.77

**Scenario Cost/Unit:** $37.31

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. | Acre | $22.03 | 25 | $550.75 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 controls 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:** 3.0

**Scenario Total Cost:** $419.97

**Scenario Cost/Unit:** $139.99

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 | $63.92 | 0.33 | $21.09 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 9 | $398.88 |

**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::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $1,959.49

**Scenario Cost/Unit:** $9.80

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. | Hour | $24.81 | 36 | $893.16 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Gutter, Aluminum, Small | 1689 | Aluminum gutter (4" to 6") in width with hangers. Materials only. | Foot | $3.00 | 200 | $600.00 |
| Downspout, Aluminum, Small | 1700 | Aluminum downspout (3" to 5") in width with hangers. Materials only. | Foot | $2.96 | 60 | $177.60 |
| **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 | $190.19 | 1 | $190.19 |

**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 attachment . 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::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $3,003.90

**Scenario Cost/Unit:** $15.02

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. | Hour | $24.81 | 54 | $1,339.74 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Dimension Lumber, untreated, rot resistant | 1613 | Untreated dimension lumber with nominal thickness equal or less than 2" milled from a rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor. | Board Foot | $1.87 | 267 | $499.29 |
| Gutter, Aluminum, Small | 1689 | Aluminum gutter (4" to 6") in width with hangers. Materials only. | Foot | $3.00 | 200 | $600.00 |
| Downspout, Aluminum, Small | 1700 | Aluminum downspout (3" to 5") in width with hangers. Materials only. | Foot | $2.96 | 60 | $177.60 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Gutter

**Scenario Unit::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $3,401.47

**Scenario Cost/Unit:** $17.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 2 | $12.76 |
| **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. | Hour | $44.32 | 1 | $44.32 |
| 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. | Hour | $24.81 | 20 | $496.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 2 | $62.50 |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 110 | $383.90 |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallon | $0.93 | 1500 | $1,395.00 |
| Gutter, Aluminum, Small | 1689 | Aluminum gutter (4" to 6") in width with hangers. Materials only. | Foot | $3.00 | 200 | $600.00 |
| Downspout, Aluminum, Small | 1700 | Aluminum downspout (3" to 5") in width with hangers. Materials only. | Foot | $2.96 | 60 | $177.60 |
| **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 | $190.19 | 1 | $190.19 |
| 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 | $0.39 | 100 | $39.00 |

**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::** Foot

**Scenario Typical Size:** 205.0

**Scenario Total Cost:** $3,976.00

**Scenario Cost/Unit:** $19.40

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 Yard | $159.14 | 8 | $1,273.12 |
| 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 Yard | $502.23 | 3 | $1,506.69 |
| 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 Yard | $2.56 | 8 | $20.48 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 5 | $64.30 |
| 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 | $0.37 | 130 | $48.10 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 8 | $250.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $2,735.22

**Scenario Cost/Unit:** $13.68

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 | $2.77 | 222 | $614.94 |
| 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 Yard | $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. | Hour | $24.81 | 6 | $148.86 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 44 | $1,375.00 |
| Pipe, HDPE, 4", PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only. | Foot | $0.47 | 220 | $103.40 |
| **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 | $190.19 | 2 | $380.38 |

**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 ground 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 surface. 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:** 2.0

**Scenario Total Cost:** $2,269.70

**Scenario Cost/Unit:** $1,134.85

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 | $2.77 | 30 | $83.10 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 16 | $500.00 |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 40 | $139.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Gallon

**Scenario Typical Size:** 33,000.0

**Scenario Total Cost:** $54,801.58

**Scenario Cost/Unit:** $1.66

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. | Hour | $61.96 | 24 | $1,487.04 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 8 | $584.80 |
| **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. | Hour | $44.32 | 72 | $3,191.04 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 120 | $2,977.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Pipe, PVC, 8", SCH 40 | 981 | Materials: - 8" - PVC - SCH 40 - ASTM D1785 | Foot | $8.65 | 200 | $1,730.00 |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallon | $0.93 | 3000 | $2,790.00 |
| Pipe, HDPE, 8", PCPT, Single Wall | 1272 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 8" diameter - ASTM F667. Material cost only. | Foot | $2.00 | 3800 | $7,600.00 |
| Gutter, Plastic, Small | 1389 | 5" PVC guttering emptying into a 4" PVC Sch-40 pipe | Foot | $2.28 | 3200 | $7,296.00 |
| Tank, Fiberglass Enclosed Storage, 10,000 gallon | 1919 | 10,000 gallon capacity enclosed fiberglass water storage tank. Includes tank anchoring materials and delivery. | Each | $7,961.86 | 3 | $23,885.58 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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::** Foot

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $8,695.74

**Scenario Cost/Unit:** $28.99

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 | $2.77 | 467 | $1,293.59 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 50 | $241.50 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 16 | $2,193.44 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 50 | $49.00 |
| **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. | Hour | $44.32 | 6 | $265.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 16 | $630.88 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 160 | $3,448.00 |
| One Species, Cool Season, Native Perennial Grass | 2312 | Native, cool season perennial grass. Includes material and shipping only. | Acre | $157.05 | 0.05 | $7.85 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $6,652.67

**Scenario Cost/Unit:** $22.18

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 Yard | $4.83 | 40 | $193.20 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 12 | $1,645.08 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 55 | $53.90 |
| **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. | Hour | $44.32 | 6 | $265.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 160 | $3,448.00 |
| One Species, Cool Season, Native Perennial Grass | 2312 | Native, cool season perennial grass. Includes material and shipping only. | Acre | $157.05 | 0.05 | $7.85 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $4,309.13

**Scenario Cost/Unit:** $14.36

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 Yard | $4.83 | 78 | $376.74 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 8 | $1,096.72 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 6 | $265.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 78 | $1,680.90 |
| One Species, Cool Season, Native Perennial Grass | 2312 | Native, cool season perennial grass. Includes material and shipping only. | Acre | $157.05 | 0.05 | $7.85 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 preparation, 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 Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $3,565.83

**Scenario Cost/Unit:** $1.78

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 | $2.77 | 222 | $614.94 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34" roller. Equipment cost only. Does not include labor. | Hour | $15.27 | 3 | $45.81 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 3 | $118.29 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 3 | $147.81 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 13 | $400.92 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 26 | $560.30 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 38 | $1,394.98 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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, including 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 Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $4,500.10

**Scenario Cost/Unit:** $2.25

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 | $2.77 | 222 | $614.94 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 4 | $389.80 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34" roller. Equipment cost only. Does not include labor. | Hour | $15.27 | 4 | $61.08 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 13 | $400.92 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 26 | $560.30 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 38 | $1,394.98 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $30,840.75

**Scenario Cost/Unit:** $6.17

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 Yard | $322.92 | 80 | $25,833.60 |
| 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 Yard | $2.56 | 185 | $473.60 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 139 | $671.37 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 4 | $292.40 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 81 | $2,531.25 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $28,954.14

**Scenario Cost/Unit:** $14.48

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 Yard | $322.92 | 32 | $10,333.44 |
| 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 Yard | $502.23 | 24 | $12,053.52 |
| 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 Yard | $2.56 | 150 | $384.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 150 | $724.50 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 150 | $594.00 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 4 | $389.80 |
| **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. | Hour | $44.32 | 24 | $1,063.68 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 32 | $1,000.00 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

**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

**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, reinforced 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 Foot

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $27,598.15

**Scenario Cost/Unit:** $11.04

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 Yard | $322.92 | 37 | $11,948.04 |
| 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 Yard | $502.23 | 15 | $7,533.45 |
| 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 Yard | $2.56 | 334 | $855.04 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 215 | $1,038.45 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 241 | $954.36 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 4 | $292.40 |
| **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. | Hour | $44.32 | 24 | $1,063.68 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 39 | $1,218.75 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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, reinforced 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 Foot

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $32,696.19

**Scenario Cost/Unit:** $13.08

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 Yard | $322.92 | 39 | $12,593.88 |
| 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 Yard | $502.23 | 15 | $7,533.45 |
| 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 Yard | $2.56 | 740 | $1,894.40 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 650 | $3,139.50 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 600 | $2,376.00 |
| **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. | Hour | $44.32 | 20 | $886.40 |
| 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. | Hour | $49.27 | 20 | $985.40 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 54 | $1,687.50 |
| **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 | $78.09 | 6 | $468.54 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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, reinforced 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 addition, 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 Foot

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $56,060.00

**Scenario Cost/Unit:** $22.42

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 Yard | $322.92 | 39 | $12,593.88 |
| 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 Yard | $502.23 | 62 | $31,138.26 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 400 | $1,932.00 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 125 | $797.50 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 600 | $2,376.00 |
| 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 | Hour | $182.75 | 6 | $1,096.50 |
| **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. | Hour | $44.32 | 32 | $1,418.24 |
| 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. | Hour | $49.27 | 32 | $1,576.64 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 54 | $1,687.50 |
| **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 | $78.09 | 4 | $312.36 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $8,971.31

**Scenario Cost/Unit:** $8.97

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 Yard | $2.56 | 37 | $94.72 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 75 | $478.50 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 97 | $384.12 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 19 | $593.75 |
| Asphalt, pavement | 1867 | Bituminous Concrete,includes materials, equipment and labor for 4" layer, base not included. | Square Foot | $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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 warranted 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $557.81

**Scenario Cost/Unit:** $557.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1.5 | $36.12 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $49.27 | 1.5 | $73.91 |
| **Materials** | | | | | | |
| Silt Fence | 43 | Silt Fence with support post. Includes materials, equipment and labor | Foot | $0.96 | 208 | $199.68 |

**Practice:** 572 - Spoil Spreading

**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 Yard

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $3,159.18

**Scenario Cost/Unit:** $3.16

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. | Hour | $137.09 | 10 | $1,370.90 |
| 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. | Hour | $17.70 | 10 | $177.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 20 | $788.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

**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:** 1.0

**Scenario Total Cost:** $5,248.59

**Scenario Cost/Unit:** $5,248.59

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 | $2.77 | 33 | $91.41 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 16 | $991.36 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 10 | $308.40 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 20 | $625.00 |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Foot | $0.08 | 1500 | $120.00 |
| Pipe, PVC, 1 1/2", SCH 40 | 975 | Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785 | Foot | $1.02 | 20 | $20.40 |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 50 | $174.50 |
| Pipe, HDPE, 4", PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only. | Foot | $0.47 | 150 | $70.50 |
| Spring Collection Box Cover, steel, 4' diameter | 1281 | 4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication. | Each | $187.22 | 1 | $187.22 |
| Well Casing, Concrete | 2173 | Concrete tile 3" diameter x 8' long. Materials only. | Foot | $62.56 | 8 | $500.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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:** 1.0

**Scenario Total Cost:** $3,104.59

**Scenario Cost/Unit:** $3,104.59

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 | $2.77 | 7 | $19.39 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 10 | $312.50 |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Foot | $0.08 | 100 | $8.00 |
| Pipe, PVC, 1 1/2", SCH 40 | 975 | Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785 | Foot | $1.02 | 20 | $20.40 |
| Spring Collection Box Cover, steel, 4' diameter | 1281 | 4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication. | Each | $187.22 | 1 | $187.22 |
| Well Casing, Concrete | 2173 | Concrete tile 3" diameter x 8' long. Materials only. | Foot | $62.56 | 8 | $500.48 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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:** 1.0

**Scenario Total Cost:** $7,637.67

**Scenario Cost/Unit:** $7,637.67

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 Yard | $502.23 | 4 | $2,008.92 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 44 | $121.88 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 20 | $1,239.20 |
| **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. | Hour | $24.81 | 64 | $1,587.84 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 20 | $503.60 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 13 | $400.92 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 25 | $781.25 |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Foot | $0.08 | 2000 | $160.00 |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 50 | $174.50 |
| Pipe, HDPE, 4", PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only. | Foot | $0.47 | 200 | $94.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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:** 1.0

**Scenario Total Cost:** $5,813.23

**Scenario Cost/Unit:** $5,813.23

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 | $2.77 | 44 | $121.88 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 16 | $991.36 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 13 | $400.92 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 25 | $781.25 |
| Poly film, 6 mil. | 245 | 6 mil, polyethylene, black | Square Foot | $0.08 | 2000 | $160.00 |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 50 | $174.50 |
| Tank, Poly Enclosed Storage, >1,000 | 1075 | Water storage tanks. Includes materials and shipping only. | Gallon | $0.93 | 1000 | $930.00 |
| Pipe, HDPE, 4", PCPT, Single Wall | 1270 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 4" diameter - ASTM F405. Material cost only. | Foot | $0.47 | 200 | $94.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 concerns 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 surfacing, 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 Foot

**Scenario Typical Size:** 3,600.0

**Scenario Total Cost:** $1,060.08

**Scenario Cost/Unit:** $0.29

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 4 | $389.80 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 0.1 | $1.23 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 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. | Acre | $13.93 | 0.1 | $1.39 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **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 | $0.50 | 3 | $1.50 |
| 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 | $0.64 | 6 | $3.84 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 6 | $2.16 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 0.2 | $18.65 |
| One Species, Warm Season, Introduced Perennial Grass (seed or sprigs) | 2323 | Introduced, warm season perennial grass seed or sprig. Includes material and shipping only. | Acre | $62.40 | 0.04 | $2.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 concerns 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 surfacing, 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 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 Walkway

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 3,600.0

**Scenario Total Cost:** $22,265.22

**Scenario Cost/Unit:** $6.18

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 Yard | $322.92 | 58 | $18,729.36 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 70 | $338.10 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 6 | $438.60 |
| **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. | Hour | $24.81 | 6 | $148.86 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 6 | $236.58 |
| 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. | Hour | $49.27 | 6 | $295.62 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 49 | $1,511.16 |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 0.02 | $1.38 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 concerns 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 aggregate 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 aggregate 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 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 Walkway

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 3,600.0

**Scenario Total Cost:** $6,134.13

**Scenario Cost/Unit:** $1.70

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 4 | $389.80 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 0.1 | $0.73 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $11.75 | 0.1 | $1.18 |
| 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. | Acre | $13.93 | 0.1 | $1.39 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34" roller. Equipment cost only. Does not include labor. | Hour | $15.27 | 4 | $61.08 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 23 | $709.32 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 45 | $1,406.25 |
| 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 | $0.50 | 6 | $3.00 |
| 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 | $0.64 | 3 | $1.92 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 3 | $1.08 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 0.2 | $18.65 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 67 | $2,459.57 |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 0.02 | $1.38 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 concerns 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 aggregate 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 aggregate 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 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 Walkway

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 3,600.0

**Scenario Total Cost:** $7,625.29

**Scenario Cost/Unit:** $2.12

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 | $2.77 | 400 | $1,108.00 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 6 | $584.70 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 0.1 | $0.73 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $11.75 | 0.1 | $1.18 |
| 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. | Acre | $13.93 | 0.1 | $1.39 |
| Roller, static, smooth, self propelled | 1392 | Self propelled smooth drum static roller compactor, typically 1.5 ton with 34" roller. Equipment cost only. Does not include labor. | Hour | $15.27 | 6 | $91.62 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 23 | $709.32 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 45 | $1,406.25 |
| 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 | $0.50 | 6 | $3.00 |
| 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 | $0.64 | 3 | $1.92 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 3 | $1.08 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 0.2 | $18.65 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 67 | $2,459.57 |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 0.02 | $1.38 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 concerns 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 surfacing, 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 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 Walkway

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 3,600.0

**Scenario Total Cost:** $16,723.07

**Scenario Cost/Unit:** $4.65

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 | $2.77 | 400 | $1,108.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 4 | $292.40 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 2 | $98.60 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $11.75 | 0.1 | $1.18 |
| 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. | Acre | $13.93 | 0.1 | $1.39 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 4 | $177.28 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 45 | $1,406.25 |
| 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 | $0.50 | 6 | $3.00 |
| 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 | $0.64 | 3 | $1.92 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 3 | $1.08 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 0.2 | $18.65 |

| | | | | | | |
|---|---|---|---|---|---|---|
| GeoCell, 4" | 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 | $32.31 | 400 | $12,924.00 |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 0.02 | $1.38 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 concerns 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 surfacing, 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 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 Walkway

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 3,600.0

**Scenario Total Cost:** $11,937.86

**Scenario Cost/Unit:** $3.32

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 Yard | $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. | Hour | $137.09 | 3 | $411.27 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 3 | $72.24 |
| **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. | Hour | $44.32 | 4 | $177.28 |
| 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. | Hour | $24.81 | 5 | $124.05 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 3 | $118.29 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 45 | $1,406.25 |
| Asphalt, pavement | 1867 | Bituminous Concrete,includes materials, equipment and labor for 4" layer, base not included. | Square Foot | $2.58 | 3600 | $9,288.00 |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 0.02 | $1.38 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 abutments, girders, decking with necessary hardware, backfilling abutments, 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 Foot

**Scenario Typical Size:** 360.0

**Scenario Total Cost:** $18,272.74

**Scenario Cost/Unit:** $50.76

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. | Hour | $61.96 | 16 | $991.36 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 8 | $855.28 |
| 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 Yard | $1.86 | 75 | $139.50 |
| **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. | Hour | $44.32 | 80 | $3,545.60 |
| 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. | Hour | $24.81 | 20 | $496.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 20 | $788.60 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 20 | $1,602.40 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 20 | $625.00 |
| Dimension Lumber, untreated | 1045 | Untreated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners. | Board Foot | $0.82 | 2000 | $1,640.00 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yard | $109.47 | 18 | $1,970.46 |
| Steel, structural steel members | 1779 | Structural steel, includes materials and fabrication. | Pound | $1.06 | 4500 | $4,770.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

## USDA - Natural Resources Conservation Service

**New York**

**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:** 1,440.0

**Scenario Total Cost:** $14,014.62

**Scenario Cost/Unit:** $9.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 18 | $114.84 |
| 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. | Hour | $125.73 | 10 | $1,257.30 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 20 | $5,242.80 |
| **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. | Hour | $24.81 | 20 | $496.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 20 | $788.60 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 27 | $2,163.24 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 50 | $1,562.50 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 36" | 1248 | Pipe, Corrugated HDPE Double Wall, 36" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $38.52 | 40 | $1,540.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

**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 Foot

**Scenario Typical Size:** 600.0

**Scenario Total Cost:** $12,393.32

**Scenario Cost/Unit:** $20.66

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. | Hour | $73.10 | 16 | $1,169.60 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 20 | $5,242.80 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 2 | $213.82 |
| 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 Yard | $1.86 | 18 | $33.48 |
| **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. | Hour | $24.81 | 40 | $992.40 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 2 | $78.86 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 20 | $1,602.40 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 6 | $185.04 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 18 | $562.50 |
| GeoCell, 4" | 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 | $32.31 | 50 | $1,615.50 |
| Block, pre-cast concrete, modular | 1496 | Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery. | Cubic Yard | $109.47 | 1.2 | $131.36 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 separate 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 foot of approach

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 480.0

**Scenario Total Cost:** $3,480.04

**Scenario Cost/Unit:** $7.25

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. | Hour | $69.35 | 4 | $277.40 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 4 | $254.48 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 23 | $1,842.76 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 6 | $185.04 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 600 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 Foot

**Scenario Typical Size:** 600.0

**Scenario Total Cost:** $3,699.77

**Scenario Cost/Unit:** $6.17

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. | Hour | $69.35 | 5 | $346.75 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 4 | $254.48 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 5 | $197.15 |
| 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. | Hour | $49.27 | 5 | $246.35 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 23 | $1,842.76 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 8 | $246.72 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 foot of approach

**Scenario Unit::** Square Foot

**Scenario Typical Size:** 480.0

**Scenario Total Cost:** $4,994.50

**Scenario Cost/Unit:** $10.41

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. | Hour | $69.35 | 4 | $277.40 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 4 | $254.48 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 23 | $1,842.76 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 6 | $187.50 |
| 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 Foot | $3.15 | 480 | $1,512.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 578 - Stream Crossing

**Scenario** #7 - Ramps and channel with Cattle Slats

**Scenario Description:**

Install a stable ramp and stabilize 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 600 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 Foot

**Scenario Typical Size:** 600.0

**Scenario Total Cost:** $9,076.52

**Scenario Cost/Unit:** $15.13

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. | Hour | $69.35 | 5 | $346.75 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 4 | $254.48 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 5 | $197.15 |
| 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. | Hour | $49.27 | 5 | $246.35 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 23 | $1,842.76 |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 8 | $246.72 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 39 | $1,218.75 |
| 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 Foot | $3.15 | 1320 | $4,158.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 20,000.0

**Scenario Total Cost:** $18,641.28

**Scenario Cost/Unit:** $0.93

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 Yard | $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. | Hour | $73.10 | 32 | $2,339.20 |
| 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. | Acre | $13.93 | 0.46 | $6.41 |
| **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. | Hour | $24.81 | 224 | $5,557.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 32 | $805.76 |
| 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. | Hour | $49.27 | 56 | $2,759.12 |
| **Materials** | | | | | | |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.46 | $17.60 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 brush mattresses, live stakes, joint plantings, vegetated geogrids, branch packing, 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 Foot

**Scenario Typical Size:** 20,000.0

**Scenario Total Cost:** $30,040.38

**Scenario Cost/Unit:** $1.50

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 Yard | $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. | Hour | $73.10 | 16 | $1,169.60 |
| 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. | Hour | $69.35 | 32 | $2,219.20 |
| 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. | Acre | $13.93 | 0.46 | $6.41 |
| **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. | Hour | $24.81 | 384 | $9,527.04 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 48 | $1,208.64 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 32 | $1,261.76 |
| 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. | Hour | $49.27 | 80 | $3,941.60 |
| **Materials** | | | | | | |
| Tree, willow | 1426 | Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only. | Each | $0.65 | 5000 | $3,250.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.46 | $17.60 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Yard

**Scenario Typical Size:** 1,667.0

**Scenario Total Cost:** $221,219.83

**Scenario Cost/Unit:** $132.71

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 Yard | $4.83 | 2500 | $12,075.00 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 48 | $3,508.80 |
| 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. | Hour | $125.73 | 33 | $4,149.09 |
| 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. | Acre | $13.93 | 0.12 | $1.67 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 60 | $15,728.40 |
| 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 Yard | $4.77 | 3500 | $16,695.00 |
| **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. | Hour | $24.81 | 352 | $8,733.12 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 48 | $1,892.64 |
| 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. | Hour | $49.27 | 80 | $3,941.60 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1667 | $133,560.04 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.55 | 5280 | $2,904.00 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.46 | $17.60 |

**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 i | Dollar | $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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 1 | $539.90 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Yard

**Scenario Typical Size:** 800.0

**Scenario Total Cost:** $108,618.49

**Scenario Cost/Unit:** $135.77

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 Yard | $4.83 | 1750 | $8,452.50 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 24 | $1,754.40 |
| 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. | Acre | $13.93 | 0.21 | $2.93 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 30 | $7,864.20 |
| 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 Yard | $4.77 | 1750 | $8,347.50 |
| **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. | Hour | $24.81 | 224 | $5,557.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 60 | $2,956.20 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 800 | $64,096.00 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.21 | $8.03 |
| **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 i | Dollar | $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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 1,500.0

**Scenario Total Cost:** $55,306.96

**Scenario Cost/Unit:** $36.87

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 Yard | $2.56 | 2923 | $7,482.88 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 2923 | $14,118.09 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 193 | $764.28 |
| 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. | Hour | $125.73 | 32 | $4,023.36 |
| 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. | Acre | $13.93 | 0.25 | $3.48 |
| **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. | Hour | $24.81 | 64 | $1,587.84 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 32 | $1,261.76 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 30 | $937.50 |
| Rock Riprap, graded, angular, material and shipping | 1200 | Graded Rock Riprap for all gradation ranges. Includes materials and delivery only. | Ton | $36.71 | 462 | $16,960.02 |
| Geotextile, non-woven, light weight | 1209 | Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only. | Square Yard | $1.22 | 2350 | $2,867.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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. | Acre | $3,755.85 | 0.25 | $938.96 |
| Cuttings, woody, medium size | 1308 | Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only. | Each | $0.48 | 6300 | $3,024.00 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.25 | $9.57 |
| **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 | $539.90 | 1 | $539.90 |

## USDA - Natural Resources Conservation Service

**New York**

**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 brush mattresses, live stakes, joint plantings, vegetated geogrids, branch packing, 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 Foot

**Scenario Typical Size:** 20,000.0

**Scenario Total Cost:** $82,841.94

**Scenario Cost/Unit:** $4.14

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 Yard | $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. | Hour | $73.10 | 32 | $2,339.20 |
| 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. | Hour | $69.35 | 32 | $2,219.20 |
| 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. | Acre | $13.93 | 0.35 | $4.88 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 30 | $7,864.20 |
| **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. | Hour | $24.81 | 128 | $3,175.68 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 32 | $805.76 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 32 | $1,261.76 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |
| **Materials** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 556 | $44,546.72 |
| 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 | $1.30 | 1667 | $2,167.10 |
| Tree, willow | 1426 | Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only. | Each | $0.65 | 3750 | $2,437.50 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.35 | $13.39 |
| **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 i | Dollar | $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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Yard

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $1,562.78

**Scenario Cost/Unit:** $3.13

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 Yard | $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 | $282.78 | 1 | $282.78 |

**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 Yard

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $2,155.42

**Scenario Cost/Unit:** $4.31

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 Yard | $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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Yard

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $3,977.78

**Scenario Cost/Unit:** $7.96

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 Yard | $2.56 | 500 | $1,280.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 500 | $2,415.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Yard

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $4,570.42

**Scenario Cost/Unit:** $9.14

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 Yard | $2.56 | 500 | $1,280.00 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 500 | $2,415.00 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Foot

**Scenario Typical Size:** 2,500.0

**Scenario Total Cost:** $10,675.70

**Scenario Cost/Unit:** $4.27

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. | Hour | $27.38 | 40 | $1,095.20 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 200 | $196.00 |
| **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. | Hour | $24.81 | 120 | $2,977.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 40 | $1,007.20 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |
| **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 | $1.30 | 800 | $1,040.00 |
| Tree, willow | 1426 | Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only. | Each | $0.65 | 1500 | $975.00 |
| Wattles or facines, 6 to 8 inch diameter | 1904 | Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 6"-8" diameter. Includes materials and shipping only. | Foot | $7.06 | 200 | $1,412.00 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.06 | $2.30 |

**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 Yard

**Scenario Typical Size:** 575.0

**Scenario Total Cost:** $49,047.51

**Scenario Cost/Unit:** $85.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | $332.67 | 0.2 | $66.53 |
| **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. | Hour | $24.81 | 20 | $496.20 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 600 | $48,072.00 |
| Tree, willow | 1426 | Willow tree for planting, 18" to 36" seedling. Includes materials and shipping only. | Each | $0.65 | 200 | $130.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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:** 3.0

**Scenario Total Cost:** $8,903.80

**Scenario Cost/Unit:** $2,967.93

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 Yard | $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. | Hour | $24.81 | 40 | $992.40 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 75 | $6,009.00 |
| Wattles or facines, 9 to 12 inch diameter | 1905 | Facines, or wattles: bundles of live tree stems of species that sprout roots, bound together. 9"- 12" diameter. Includes materials and shipping only. | Foot | $12.00 | 150 | $1,800.00 |

**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::** Acre

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $146.67

**Scenario Cost/Unit:** $1.83

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 3 | $72.24 |
| **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. | Hour | $24.81 | 3 | $74.43 |

**Practice:** 587 - Structure for Water Control

**Scenario** #2 - Inline Flashboard Riser, Metal

**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:** 1,800.0

**Scenario Total Cost:** $7,739.60

**Scenario Cost/Unit:** $4.30

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 Yard | $4.83 | 190 | $917.70 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 15 | $95.70 |
| 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. | Hour | $69.35 | 4 | $277.40 |
| **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. | Hour | $44.32 | 7 | $310.24 |
| 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. | Hour | $24.81 | 10 | $248.10 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| **Materials** | | | | | | |
| Pipe, Steel, 30", Std Wt, USED | 1361 | Materials: - USED - 30" - Steel Std Wt | Foot | $83.21 | 50 | $4,160.50 |
| Pipe, Steel, 36", Std Wt, USED | 1362 | Materials: - USED - 36" - Steel Std Wt | Foot | $106.25 | 6 | $637.50 |
| Steel, Angle, 2 1/2" x 2 1/2" x 1/4" | 1372 | Materials: Angle, 2 1/2" x 2 1/2" x 1/4", Meets ASTM A36 | Foot | $3.60 | 24 | $86.40 |
| Steel, Plate, 3/8" | 1375 | Flat steel plate, 3/8" thickness. Materials only. | Square Foot | $12.04 | 10 | $120.40 |
| Lumber, planks, posts and timbers, treated | 1609 | Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor. | Board Foot | $1.55 | 4 | $6.20 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 587 - Structure for Water Control

**Scenario** #3 - Commercial Inline Flashboard Riser

**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:** 1,000.0

**Scenario Total Cost:** $4,597.63

**Scenario Cost/Unit:** $4.60

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 Yard | $4.83 | 190 | $917.70 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 15 | $95.70 |
| 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. | Hour | $69.35 | 2 | $138.70 |
| **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. | Hour | $44.32 | 3 | $132.96 |
| 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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 2 | $78.86 |
| **Materials** | | | | | | |
| Pipe, PVC, 16", SCH 80 | 1353 | Materials: - 16" - PVC - SCH 80 - ASTM D1785 | Foot | $44.82 | 50 | $2,241.00 |
| 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. Fixed cost portion. Materials only. | Each | $312.56 | 1 | $312.56 |
| 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 | $12.08 | 10 | $120.80 |
| **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 | $78.09 | 1 | $78.09 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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:** 960.0

**Scenario Total Cost:** $2,924.41

**Scenario Cost/Unit:** $3.05

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 Yard | $2.56 | 5 | $12.80 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 45 | $287.10 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 2 | $160.24 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 5 | $156.25 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24" | 1246 | Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $23.22 | 40 | $928.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

## USDA - Natural Resources Conservation Service

**New York**

**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:** 960.0

**Scenario Total Cost:** $3,200.41

**Scenario Cost/Unit:** $3.33

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 Yard | $2.56 | 5 | $12.80 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 45 | $287.10 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 2 | $160.24 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 5 | $156.25 |
| Pipe, CMP, 24", 12 Gauge | 1417 | 24" Corrugated Metal Pipe, Galvanized, Uncoated, 12 gage. Material cost only. | Foot | $30.12 | 40 | $1,204.80 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

## USDA - Natural Resources Conservation Service

**New York**

**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 facility. 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 Transfer (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:** 1.0

**Scenario Total Cost:** $1,908.97

**Scenario Cost/Unit:** $1,908.97

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 Yard | $502.23 | 1.2 | $602.68 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 4 | $247.84 |
| **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. | Hour | $44.32 | 6 | $265.92 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 0.5 | $15.63 |
| Welded Bar Grate, metal | 1980 | Heavy duty vertical bar welded grating, typically 1-1/4"x 3/16" bars on 1" spacing with cross rod on 4" spacing. Materials only. | Square Foot | $14.09 | 15 | $211.35 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 587 - Structure for Water Control

**Scenario** #7 - Water Bar

**Scenario Description:**

This scenario is the installation of a permanent 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 causing 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 across 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:** 3.0

**Scenario Total Cost:** $2,470.86

**Scenario Cost/Unit:** $823.62

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 Yard | $4.83 | 1 | $4.83 |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 3 | $292.35 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 3 | $118.29 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 28 | $875.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 4 | $1,131.12 |

**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 facility. 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 Transfer (634), Solid/Liquid Waste Separation Facility (632)

**Before Situation:**

Upsite surface water causing downslope erosion or adding clean water 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:** 1.0

**Scenario Total Cost:** $1,377.39

**Scenario Cost/Unit:** $1,377.39

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. | Hour | $61.96 | 1 | $61.96 |
| **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. | Hour | $44.32 | 1 | $44.32 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 0.4 | $12.50 |
| Catch Basin, concrete, 2'x2'x6' | 1257 | Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor. | Each | $667.87 | 1 | $667.87 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 587 - Structure for Water Control

**Scenario** #13 - In-Stream Structure for Water Surface Profile

**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::** Foot

**Scenario Typical Size:** 36.0

**Scenario Total Cost:** $11,679.56

**Scenario Cost/Unit:** $324.43

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 Yard | $502.23 | 19 | $9,542.37 |
| 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 Yard | $2.56 | 18 | $46.08 |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 1 | $262.14 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $49.27 | 7 | $344.89 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**Practice:** 587 - Structure for Water Control

**Scenario** #283 - Forestland Waterbar

**Scenario Description:**

This scenario is utilized for the installation of permanent 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:** 5.0

**Scenario Total Cost:** $860.53

**Scenario Cost/Unit:** $172.11

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. | Hour | $73.10 | 2.5 | $182.75 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2.5 | $62.95 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 1 | $49.27 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 35.0

**Scenario Total Cost:** $1,215.41

**Scenario Cost/Unit:** $34.73

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. | Hour | $137.09 | 4 | $548.36 |
| **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. | Hour | $44.32 | 4 | $177.28 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 589C - Cross Wind Trap Strips

**Scenario** #5 - Cross Wind Trap Strips, Native Perennials

**Scenario Description:**

This scenario describes the implementation of cross wind trap strips with native perennial grasses and/or legumes 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:**

Typically, 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 as outlined in the National Agronomy Manual. Typically the strips occupy about 7-10% of the area.

**After Situation:**

Implementation Requirements will be prepared for the site and implemented according the Cross Wind Trap Strips (589C) 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.). For this scenario, the strips will consist of native perennial species, generally placed across an entire field. Implementation will reduce soil loss to a tolerable level. The scenario includes costs associated with the establishment of the trap strips.

**Feature Measure:** Acres of trap strips

**Scenario Unit::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $201.21

**Scenario Cost/Unit:** $201.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Site Preparation, Mechanical | 944 | Aerator, rolling drum chopper, etc. Includes equipment, power unit and labor costs. | Acre | $68.84 | 1 | $68.84 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 1.6 | $39.70 |
| **Materials** | | | | | | |
| Untreated Conventional Seed, One Species, Warm Season, Native Perennial Grass | 2341 | Untreated conventional native, warm season perennial grass. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $69.06 | 1 | $69.06 |

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $143.40

**Scenario Cost/Unit:** $3.59

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 2 | $20.08 |

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $971.35

**Scenario Cost/Unit:** $24.28

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 40 | $734.00 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 2 | $20.08 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 1 | $44.78 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $49.17 | 1 | $49.17 |

**Practice:** 590 - Nutrient Management

**Scenario** #3 - Small Farm NM (Non-Organic/Organic)

**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:** 1.0

**Scenario Total Cost:** $163.65

**Scenario Cost/Unit:** $163.65

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. | Hour | $24.81 | 2 | $49.62 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 2 | $20.08 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 1 | $44.78 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $49.17 | 1 | $49.17 |

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $237.35

**Scenario Cost/Unit:** $5.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 2 | $20.08 |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 1 | $44.78 |
| Test, Compost Analysis | 307 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $49.17 | 1 | $49.17 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 590 - Nutrient Management

**Scenario** #5 - NM Nitrification/Urease Inhibitors, variable rate, grid/zone soil sampling, soil nitrate/plant tissue test (Non-Organic/Organic)

### Scenario Description:

This scenario takes a conventional cropping system where either no nutrient management or only a very 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. The planned NM system will meet the current Nutrient Management (590) CPS general and additional criteria. Nutrient management system includes such items as split applications, variable rate applications, nitrification or urease inhibitors, additional nutrient tests including PSNT (pre-side dress nitrogen test), CSNT (corn stalk nitrate test), and PPSN (pre-plant soil nitrate test), chlorophyll meters, and/or spectral analysis may be used to further refine nutrient applications. Payment for implementation is to defray the costs of grid or zone soil testing, additional testing and analysis, nitrification or urease inhibitors, equipment, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

### Before Situation:

In this geographic area, conventional fertility programs involve very little or no soil or manure testing. Application of fertilizers, including manures and amendments, are completed annually based upon tradition that 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. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Runoff flows into adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters or leaching of nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil quality may also be detrimentally affected.

### After Situation:

A nutrient management system will be developed to meet the current Nutrient Management (590) CPS general and additional criteria, when applicable system will also meet NOP regulations. Development and implementation of a Nutrient Management Plan (NMP) base on the 4Rs will benefit plant productivity while reducing potential of off-site movement of nutrients, including the use of nitrification or urease inhibitors to reduce nitrogen emissions. NMP may include practices such as use of split applications, slow release nutrients, nitrification inhibitors, urease inhibitors, proper timing of application, more appropriate formulations, banding, etc. Additional nutrient tests including PSNT (pre-side dress nitrogen test), CSNT (corn stalk nitrate test), and PPSN (pre-plant soil nitrate test), chlorophyll meters, spectral analysis, etc., may also be used to further refine nutrient applications. Use of a post-harvest soil test or tissue tests will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Potential for offsite movement of nutrient may be further reduced by identifying variability across the field(s) by using soil survey maps or other simple techniques to establish management zones, along with grid or zone soil testing. Nutrients are applied at rates based on soil test zone analyses. Nitrogen and Phosphorus risk assessment tools are completed and results included in the nutrient management system specifications as required by current NRCS 590 CPS criteria and any mitigation measures are included in the conservation plan if determined needed by risk assessment results. Soil testing is completed according to LGU recommendations. Analysis are completed at least once every three years for N-P-K, and for N annually. A nutrient budget is developed for each field or management zone annually. Records will be provided annually of the current soil test, analysis, application rates, forms and rates of nutrients for each field, including crop yields.

**Feature Measure:** <Unknown>

**Scenario Unit::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $1,298.53

**Scenario Cost/Unit:** $32.46

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 2 | $62.52 |
| Chlorophyll Reader | 1125 | Applicator and chlorophyll sensor includes labor.?? No materials | Acre | $11.26 | 40 | $450.40 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| 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. | Hour | $104.31 | 1 | $104.31 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acre | $8.55 | 40 | $342.00 |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 15 | $154.65 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 1 | $24.61 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $12.64 | 1 | $12.64 |

**Practice:** 590 - Nutrient Management

**Scenario** #6 - NM grid/zone soil sampling, variable rate, soil nitrate/plant tissue test (Non-Organic/Organic)

**Scenario Description:**

This scenario takes a conventional cropping system where either no nutrient management or only a very basic level of nutrient management is being practiced and improves it to minimize agricultural nonpoint source pollution of surface and groundwater. The planned NM system will meet the current Nutrient Management (590) CPS general and additional criteria. Nutrient management system includes such items as split applications, variable rate applications, additional nutrient tests including PSNT (pre-side dress nitrogen test), CSNT (corn stalk nitrate test), and PPSN (pre-plant soil nitrate test), chlorophyll meters, and/or spectral analysis may be used to further refine nutrient applications. Payment for implementation is to defray the costs of grid or zone soil testing, additional testing and analysis, equipment, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

**Before Situation:**

In this geographic area, conventional fertility programs involve very little or no soil or manure testing. Application of fertilizers, including manures and amendments, are completed annually based upon tradition that does not specifically consider the detrimental affects of improper timing or rates of nutrients or excess nutrient build-up in the soil. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion by spring. Runoff flows into adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters or leaching of nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil quality may also be detrimentally affected.

**After Situation:**

A nutrient management system will be developed to meet the current Nutrient Management (590) CPS general and additional criteria, when applicable system will also meet NOP regulations. Development and implementation of a Nutrient Management Plan (NMP) base on the 4Rs will benefit plant productivity while reducing potential of off-site movement of nutrients. NMP may include practices such as use of split applications, slow release nutrients, proper timing of application, more appropriate formulations, banding, etc. Additional nutrient tests including PSNT (pre-side dress nitrogen test), CSNT (corn stalk nitrate test), and PPSN (pre-plant soil nitrate test), chlorophyll meters, spectral analysis, etc., may also be used to further refine nutrient applications. Use of a post-harvest soil test or tissue tests will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Potential for offsite movement of nutrient may be further reduced by identifying variability across the field(s) by using soil survey maps or other simple techniques to establish management zones, along with grid or zone soil testing. Nutrients are applied at rates based on soil test zone analyses. Nitrogen and Phosphorus risk assessment tools are completed and results included in the nutrient management system specifications as required by current NRCS 590 CPS criteria and any mitigation measures are included in the conservation plan if determined needed by risk assessment results. Soil testing is completed according to LGU recommendations. Analysis are completed at least once every three years for N-P-K, and for N annually. A nutrient budget is developed for each field or management zone annually. Records will be provided annually of the current soil test, analysis, application rates, forms and rates of nutrients for each field, including crop yields.

**Feature Measure:** <Unknown>

**Scenario Unit::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $932.45

**Scenario Cost/Unit:** $23.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 2 | $62.52 |
| Chlorophyll Reader | 1125 | Applicator and chlorophyll sensor includes labor.?? No materials | Acre | $11.26 | 40 | $450.40 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| 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. | Hour | $104.31 | 1 | $104.31 |
| **Materials** | | | | | | |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 15 | $154.65 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 1 | $24.61 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $12.64 | 1 | $12.64 |

**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:** 1.0

**Scenario Total Cost:** $1,981.81

**Scenario Cost/Unit:** $1,981.81

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Satellite imagery, aerial photography, infrared | 966 | Infrared imagery | Acre | $0.17 | 1 | $0.17 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $104.31 | 10 | $1,043.10 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 2 | $20.08 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 14 | $344.54 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $12.64 | 14 | $176.96 |

**Practice:** 591 - Amendments for the Treatment of Agricultural Waste

**Scenario** #4 - Liquid Animal Waste Amendment

**Scenario Description:**

This practice scenario includes the treatment of liquid animal waste for odor control. The purpose of the practice is to address resource concerns related to air quality impacts from objectionable odors caused by manure storage in a facility close to a small town. Associated practices: Nutrient Management (590), Waste Storage Facility (313).

**Before Situation:**

Before application of the waste amendment, the liquid manure in the storage facility is creating significant odor problems. The producer is receiving complaints from neighbors.

**After Situation:**

This practice scenario is applicable for all types of liquid animal waste. A swine operation has been chosen for this scenario example. Typical implementation scenario is a pit under a swine production building for 1180 head of lactating sows, 400 lb each. The pit is 100' x 140' x 8' deep; 1' freeboard and 1' unpumpable sludge reduces working depth to 6'. This scenario is based on the working volume of manure stored and treated per year. The working volume in the manure storage facility is 84,000 cubic feet, and the facility is emptied every 6 months. The resulting total annual working volume of manure to be treated with the amendment is 168,000 cubic feet. An NRCS approved amendment is applied periodically according to manufacturer's instructions, typically on a monthly basis. The manufacturer's recommended dosage is based on the volume of manure added to the waste storage facility between amendment doses. The resulting waste contains higher levels of nutrients, which is accounted for in the nutrient management plan. Nutrient level testing of the liquid manure and nutrient planning is done in conformance with CPS Nutrient Management, Code 590. The amendment is proven to reduce odor by up to 83%, and successfully reduces the objectionable odors on the site. Complaints from neighbors are no longer received.

**Feature Measure:** Cubic Feet of required manure stor

**Scenario Unit::** Cubic Foot

**Scenario Typical Size:** 168,000.0

**Scenario Total Cost:** $3,208.86

**Scenario Cost/Unit:** $0.02

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. | Hour | $24.81 | 6 | $148.86 |
| **Materials** | | | | | | |
| Ag Waste Amendment, digestive enzymes, 10 liter container | 1688 | 10 liter container of an organic manure amendment. Liquefied lignite coal. Materials only. | Each | $90.00 | 34 | $3,060.00 |

**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:** 1.0

**Scenario Total Cost:** $3,681.56

**Scenario Cost/Unit:** $3,681.56

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. | Hour | $44.32 | 24 | $1,063.68 |
| 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. | Hour | $24.81 | 24 | $595.44 |
| 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. | Hour | $104.31 | 12 | $1,251.72 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 4 | $179.12 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $36.86 | 16 | $589.76 |
| 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 | $0.46 | 4 | $1.84 |

**Practice:** 592 - Feed Management

**Scenario** #6 - Cow Dairy, Large

**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 operation milks 500 Holstein cows at average weight of 1,400 pounds, or 700 animal units. A baseline analysis of manure, feed, and milk will be completed to determine the current nutrient inputs and outputs. The Producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a herd of this type and at this stage of production (12% 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, or feeding based on individual rolling average production.

**Feature Measure:** Number of 1000 pound animal unit

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 700.0

**Scenario Total Cost:** $2,961.84

**Scenario Cost/Unit:** $4.23

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. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $24.81 | 20 | $496.20 |
| 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. | Hour | $104.31 | 12 | $1,251.72 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 4 | $179.12 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $36.86 | 16 | $589.76 |
| 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 | $0.46 | 4 | $1.84 |

**Practice:** 592 - Feed Management

**Scenario** #7 - Dairy, Small

**Scenario Description:**

Feed ration management on a small 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 operation milks 50 Jersey and Guernsey cows at average weight of 1,000 pounds, or 50 animal units. A baseline analysis of manure, feed, and milk will be completed to determine the current nutrient inputs and outputs. The Producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a herd of this type and at this stage of production (12% protein and 0.35% phosphorus). The producer will also implement pasturing of his herd part to the time where the animals will obtain some of their diet by grazing pastures as well as 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.

**Feature Measure:** Number of 1000 pound animal unit

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,842.62

**Scenario Cost/Unit:** $36.85

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. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $24.81 | 12 | $297.72 |
| 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. | Hour | $104.31 | 6 | $625.86 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 4 | $179.12 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $36.86 | 8 | $294.88 |
| 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 | $0.46 | 4 | $1.84 |

**Practice:** 592 - Feed Management

**Scenario** #8 - Livestock

**Scenario Description:**

This example is feed ration management on a swine finishing operation that does not have access to enough acres to spread all of the nutrients in the manure, at agronomic rates. The resource concerns are water quality, and excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce these excess nutrients to a point where they can be fully utilized at agronomic rates on the existing land base, thereby reducing or eliminating water quality degradation concerns. Associated Practices: Nutrient management (590)

**Before Situation:**

The producer is feeding a single diet with a higher level of protein (16%) and phosphorus (0.65%) than is needed to meet National Research Council (NRC) recommendations for animals of this type and at this stage of production.

**After Situation:**

This scenario's operation currently houses 2800 finishing hogs with an average weight of 154 pounds (307 pound live finished weight/2), or 430 animal units (2800 hogs * 154 lbs average hog weight / 1000 lbs AU = 430 AU). The farm typically grows out 2.5 turns per year (430 AU * 2.5 = 1075 AU). A baseline analysis of manure and feed will be completed to determine the current nutrient inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for animals of this type and at this stage of production. Producer will consider alternative feedstuffs, phase feeding, split-sex feeding and other scenarios to achieve the objective. Proper feed management removes excess nutrients from the manure, making the manure easier for the producer to properly manage within his/her land constraints. The improved manure management prevents surface and groundwater degradation from excess nitrogen and phosphorus.

**Feature Measure:** Number of 1000 pound animal unit

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 1,075.0

**Scenario Total Cost:** $2,308.60

**Scenario Cost/Unit:** $2.15

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. | Hour | $44.32 | 12 | $531.84 |
| 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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $104.31 | 12 | $1,251.72 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 4 | $179.12 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $36.86 | 4 | $147.44 |

**Practice:** 592 - Feed Management

**Scenario** #9 - Meat Bird

**Scenario Description:**

This example is feed ration management on a meat bird operation that does not have access to enough acres to spread all of the nutrients in the manure, at agronomic rates. The resource concerns are water quality, and excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce these excess nutrients to a point where they can be fully utilized at agronomic rates on the existing land base, thereby reducing or eliminating water quality degradation concerns. Associated Practices: Nutrient management (590)

**Before Situation:**

The producer is feeding animals a single diet with a higher nutrient levels than are needed to meet National Research Council (NRC) recommendations for animals of this type and at this stage of production.

**After Situation:**

This scenario's operation currently houses 60,000 broilers in three houses of 20,000 birds. Each house has 5 turns per year with an average weight of 2.5 pounds per bird (5 pound live finished weight/2). The operation annually raises a total of 750 animal units (60,000 birds * 5 turns * 2.5 lbs average weight of bird/1000 lbs AU = 750 AU). A baseline analysis of manure and feed will be completed to determine the current nutrient inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for animals of this type and at this stage of production. Producer will consider alternative feedstuffs, phase feeding, split-sex feeding and other scenarios to achieve the objective. Proper feed management removes excess nutrients from the manure, making the manure easier for the producer to properly manage within his/her land constraints. The improved manure management prevents surface and groundwater degradation from excess nitrogen and phosphorus.

**Feature Measure:** Number of 1000 pound animal unit

**Scenario Unit::** Animal Unit

**Scenario Typical Size:** 750.0

**Scenario Total Cost:** $2,885.75

**Scenario Cost/Unit:** $3.85

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. | Hour | $44.32 | 15 | $664.80 |
| 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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $104.31 | 15 | $1,564.65 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 5 | $223.90 |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $36.86 | 5 | $184.30 |

**Practice:** 592 - Feed Management

**Scenario** #10 - Dairy,Group

**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 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, or feeding based on individual rolling average production.

**Feature Measure:** Group

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,755.37

**Scenario Cost/Unit:** $2,755.37

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. | Hour | $24.81 | 24 | $595.44 |
| 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. | Hour | $104.31 | 15 | $1,564.65 |
| **Materials** | | | | | | |
| Test, Feed Analysis | 1989 | Representative sample of feed. Includes materials and shipping only. | Each | $36.86 | 16 | $589.76 |
| 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 | $0.46 | 12 | $5.52 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #1 - Basic IPM Field 1RC

**Scenario Description:**

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Field/Forage Crops to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $714.50

**Scenario Cost/Unit:** $17.86

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. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $104.31 | 6 | $625.86 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #2 - Basic IPM Field >1RC

**Scenario Description:**

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Field/Forage Crops to address multiple identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risks to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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 two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

**After Situation:**

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for "Intermediate", "High" or "Extra High" WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $967.44

**Scenario Cost/Unit:** $24.19

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. | Hour | $44.32 | 3 | $132.96 |
| 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. | Hour | $104.31 | 8 | $834.48 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #3 - Advanced Field All RCs

**Scenario Description:**

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Field/Forage Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $1,429.00

**Scenario Cost/Unit:** $35.73

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. | Hour | $44.32 | 4 | $177.28 |
| 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. | Hour | $104.31 | 12 | $1,251.72 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #4 - Basic IPM Fruit/Veg 1RC

**Scenario Description:**

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Small Fruit/Vegetable Crops to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for at least one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,011.76

**Scenario Cost/Unit:** $101.18

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. | Hour | $44.32 | 4 | $177.28 |
| 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. | Hour | $104.31 | 8 | $834.48 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #5 - Basic IPM Fruit/Veg >1RC

**Scenario Description:**

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Small Fruit/Vegetable Crops to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risk to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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 two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

**After Situation:**

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,309.02

**Scenario Cost/Unit:** $130.90

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. | Hour | $44.32 | 6 | $265.92 |
| 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. | Hour | $104.31 | 10 | $1,043.10 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #6 - Advanced IPM Fruit/Veg All RCs

**Scenario Description:**

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Small Fruit/Vegetable Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,007.85

**Scenario Cost/Unit:** $200.79

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. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $104.31 | 15 | $1,564.65 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #7 - Basic IPM Orchard 1RC

**Scenario Description:**

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for at least one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,309.02

**Scenario Cost/Unit:** $130.90

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. | Hour | $44.32 | 6 | $265.92 |
| 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. | Hour | $104.31 | 10 | $1,043.10 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #8 - Basic IPM Orchard >1RC

**Scenario Description:**

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risks to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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 two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

**After Situation:**

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,007.85

**Scenario Cost/Unit:** $200.79

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. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $104.31 | 15 | $1,564.65 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #9 - Advanced IPM Orchard All RCs

**Scenario Description:**

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,194.20

**Scenario Cost/Unit:** $319.42

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. | Hour | $44.32 | 25 | $1,108.00 |
| 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. | Hour | $104.31 | 20 | $2,086.20 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #10 - IPM S-Farm 1RC

**Scenario Description:**

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Small Farm/Diversified Systems (e.g. CSA, organic, etc.) to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems. Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for at least one identified resource concern resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $610.19

**Scenario Cost/Unit:** $610.19

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. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #11 - IPM S-Farm >1RC

**Scenario Description:**

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Small Farm/ Diversified Systems (e.g. CSA, organic, etc.) to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems. Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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 two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

**After Situation:**

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $803.14

**Scenario Cost/Unit:** $803.14

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. | Hour | $44.32 | 4 | $177.28 |
| 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. | Hour | $104.31 | 6 | $625.86 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #12 - Advanced IPM S-Farm All RCs

**Scenario Description:**

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Small Farm/Diversified Systems (e.g. CSA, Organic, etc.) to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings. This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems. Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

**Feature Measure:** Acres of management applied

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,204.71

**Scenario Cost/Unit:** $1,204.71

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. | Hour | $44.32 | 6 | $265.92 |
| 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. | Hour | $104.31 | 9 | $938.79 |

**Practice:** 595 - Integrated Pest Management (IPM)

**Scenario** #13 - Risk Prevention IPM All RCs

**Scenario Description:**

A comprehensive IPM plan based primarily on LGU-approved pest prevention and avoidance techniques is applied to prevent negative impacts on all identified resource concerns. LGU-approved pest monitoring techniques and pest thresholds may also be included, but suppression techniques cannot pose any hazards to identified resource concerns. This type of system is very difficult to achieve, but may be most commonly achieved in Organic Systems that already rely heavily on prevention and avoidance techniques. Associated Practices: Agrichemical Handling Facility (309), Brush Management (314), Herbaceous Cover (315), Conservation Crop Rotation (328), Residue and Tillage Management - No-Till/Strip Till/Directs Seed (329), Cover Crop (340), Residue and Tillage Management - Mulch Till (345), Residue and Tillage Management - Ridge Till (346), Field Border (386), Riparian Herbaceous Cover (390), Riparian Forest Buffer (391), Filter Strip (393), Irrigation Water Management (449), Mulching (484), Forage Harvest Management (511), and Nutrient Management (590)

**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).

**After Situation:**

After implementing the 595 practice, a comprehensive IPM plan based primarily on Land Grant University approved pest prevention and avoidance techniques is applied to prevent negative impacts on all identified resource concerns. Land Grant University approved pest monitoring techniques and pest thresholds may also be included, but suppression techniques cannot pose any hazards to identified resource concerns.

**Feature Measure:** Acres of management applied

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,707.90

**Scenario Cost/Unit:** $170.79

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. | Hour | $44.32 | 15 | $664.80 |
| 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. | Hour | $104.31 | 10 | $1,043.10 |

**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::** Foot

**Scenario Typical Size:** 750.0

**Scenario Total Cost:** $3,558.68

**Scenario Cost/Unit:** $4.74

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. | Hour | $137.09 | 18 | $2,467.62 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 18 | $709.74 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 750.0

**Scenario Total Cost:** $4,667.07

**Scenario Cost/Unit:** $6.22

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. | Hour | $137.09 | 24 | $3,290.16 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 3 | $147.81 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 750.0

**Scenario Total Cost:** $2,548.83

**Scenario Cost/Unit:** $3.40

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. | Hour | $137.09 | 12 | $1,645.08 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| 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. | Hour | $49.27 | 3 | $147.81 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 750.0

**Scenario Total Cost:** $3,607.95

**Scenario Cost/Unit:** $4.81

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. | Hour | $137.09 | 18 | $2,467.62 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 18 | $709.74 |
| 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. | Hour | $49.27 | 3 | $147.81 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Number

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $10.22

**Scenario Cost/Unit:** $0.01

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. | Acre | $12.32 | 0.09 | $1.11 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.09 | $2.12 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 0.09 | $0.77 |
| **Materials** | | | | | | |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 0.09 | $6.22 |

**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::** Number

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $762.55

**Scenario Cost/Unit:** $7.63

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. | Acre | $6.78 | 0.01 | $0.07 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 0.01 | $0.07 |
| Ground sprigging | 1101 | Includes costs for equipment, power unit and labor. | Acre | $81.18 | 0.01 | $0.81 |
| **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 | $0.92 | 0.46 | $0.42 |
| 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. | Acre | $17.48 | 0.01 | $0.17 |
| One Species, Warm Season, Introduced Perennial Rhizome | 2324 | Cool season introduced perennial rhizome. Includes material and shipping only. | 100 Foot | $761.00 | 1 | $761.00 |

**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 Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $124.83

**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. | Hour | $24.08 | 2 | $48.16 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 2 | $49.62 |
| **Materials** | | | | | | |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.09 | $3.44 |

**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 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 Yard

**Scenario Typical Size:** 333.0

**Scenario Total Cost:** $18,517.86

**Scenario Cost/Unit:** $55.61

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 | $2.77 | 807 | $2,235.39 |
| 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 Yard | $2.56 | 333 | $852.48 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 333 | $1,318.68 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 8 | $394.40 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yard | $24.76 | 366 | $9,062.16 |
| Trenching, Earth, 24" x 60" | 1460 | Trenching, earth, 24" wide x 60" depth, includes equipment and labor for trenching and backfilling. | Foot | $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. | Hour | $24.81 | 16 | $396.96 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6", CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only. | Foot | $1.13 | 90 | $101.70 |
| Water Level Control Structure, Inline, 2 Baffle, 10" diameter | 2021 | Inline Inlet WCS 6' High x 10" Dia.connections , 2 baffle (3 compartments) | Each | $1,933.68 | 1 | $1,933.68 |
| 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. Fixed cost portion. Materials only. | Each | $312.56 | 1 | $312.56 |
| 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 | $12.08 | 60 | $724.80 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10" | 2204 | Pipe, Corrugated HDPE Double Wall 10" diameter with water tight joints meeting ASTM F477. Material cost only. | Foot | $5.47 | 40 | $218.80 |

**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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Yard

**Scenario Typical Size:** 222.0

**Scenario Total Cost:** $11,795.95

**Scenario Cost/Unit:** $53.13

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 Yard | $2.56 | 333 | $852.48 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 200 | $792.00 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yard | $24.76 | 222 | $5,496.72 |
| Trenching, Earth, 24" x 60" | 1460 | Trenching, earth, 24" wide x 60" depth, includes equipment and labor for trenching and backfilling. | Foot | $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. | Hour | $24.81 | 16 | $396.96 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6", CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only. | Foot | $1.13 | 90 | $101.70 |
| Water Level Control Structure, Inline, 2 Baffle, 10" diameter | 2021 | Inline Inlet WCS 6' High x 10" Dia.connections , 2 baffle (3 compartments) | Each | $1,933.68 | 1 | $1,933.68 |
| 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. Fixed cost portion. Materials only. | Each | $312.56 | 1 | $312.56 |
| 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 | $12.08 | 60 | $724.80 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10" | 2204 | Pipe, Corrugated HDPE Double Wall 10" diameter with water tight joints meeting ASTM F477. Material cost only. | Foot | $5.47 | 40 | $218.80 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $5,193.07

**Scenario Cost/Unit:** $5.19

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, tile line plowing, earth, 60" | 1457 | Plowing in 3"-15" CPP drain line into earth, 60" depth, includes equipment and labor for trenching, laying, and backfilling. | Foot | $2.65 | 1000 | $2,650.00 |
| **Materials** | | | | | | |
| Pipe, HDPE, corrugated single wall, <= 12" weight priced Compound | 1380 | High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only. | Pound | $1.60 | 500 | $800.00 |
| Drainage Lateral Connection | 1458 | Connect 3"-6" drainage lateral to main drain, includes excavation to 6' depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee. | Each | $32.57 | 3 | $97.71 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $6,240.59

**Scenario Cost/Unit:** $6.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Track Loader, 95HP | 935 | Equipment and power unit costs. Labor not included. | Hour | $97.45 | 4 | $389.80 |
| Trenching, Earth, 12" x 60" | 1459 | Trenching, earth, 12" wide x 60" depth, includes equipment and labor for trenching, laying 3"-6" CPP drain line with envelope, and backfilling. | Foot | $2.15 | 1000 | $2,150.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 32 | $1,000.00 |
| Pipe, HDPE, corrugated single wall, <= 12" weight priced Compound | 1380 | High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only. | Pound | $1.60 | 500 | $800.00 |
| Drainage Lateral Connection | 1458 | Connect 3"-6" drainage lateral to main drain, includes excavation to 6' depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee. | Each | $32.57 | 3 | $97.71 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 2 | $1,079.80 |

**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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $13,422.80

**Scenario Cost/Unit:** $26.85

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. | Hour | $181.78 | 12 | $2,181.36 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 296 | $9,250.00 |
| Pipe, HDPE, corrugated single wall, <= 12" weight priced Compound | 1380 | High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only. | Pound | $1.60 | 150 | $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 | $539.90 | 2 | $1,079.80 |

**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 Yard

**Scenario Typical Size:** 1,406.0

**Scenario Total Cost:** $3,979.74

**Scenario Cost/Unit:** $2.83

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 Yard | $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 | $190.19 | 2 | $380.38 |

**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 Yard

**Scenario Typical Size:** 2,738.0

**Scenario Total Cost:** $7,199.47

**Scenario Cost/Unit:** $2.63

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 Yard | $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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #1 - Individual tree - hand plant w tubes

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing. The existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490)

**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. Wildlife are known to browse tree seedlings in the area causing great damage. The resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

**After Situation:**

The prescribed number of trees are hand planted on 10 acres at a rate of 300 trees per acre, and the objectives of the landowner are met. Seedlings are protected from wildlife browsing by installing some type of protection device. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

**Feature Measure:** Each Planted Seedling

**Scenario Unit::** Each

**Scenario Typical Size:** 3,000.0

**Scenario Total Cost:** $27,518.90

**Scenario Cost/Unit:** $9.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 15 | $361.20 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 25 | $781.50 |
| 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. | Hour | $7.12 | 15 | $106.80 |
| 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. | Hour | $12.04 | 75 | $903.00 |
| **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. | Hour | $24.81 | 100 | $2,481.00 |
| 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. | Hour | $49.27 | 20 | $985.40 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 3000 | $1,830.00 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 3000 | $15,360.00 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 3000 | $4,710.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #2 - Individual tree - hand planting

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing. The existing stand of trees needs underplanting, 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)

**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 landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. The resource concern is degraded plant condition: inadequate structure and composition, and inadequate wildlife & fish habitat.

**After Situation:**

The prescribed number of trees are hand planted on 10 acres at a rate of 600 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:** Each Planted Seedling

**Scenario Unit::** Each

**Scenario Typical Size:** 6,000.0

**Scenario Total Cost:** $5,860.02

**Scenario Cost/Unit:** $0.98

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| 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. | Hour | $7.12 | 16 | $113.92 |
| 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. | Hour | $12.04 | 50 | $602.00 |
| **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. | Hour | $24.81 | 50 | $1,240.50 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Tree, conifer, seedling, bare root, 1-1 | 1513 | Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only. | Each | $0.41 | 6000 | $2,460.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 3000 | $270.00 |

**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 wildlife. 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 wildlife - 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:** 2,000.0

**Scenario Total Cost:** $2,370.21

**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. | Hour | $24.08 | 8 | $192.64 |
| 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. | Hour | $7.12 | 8 | $56.96 |
| 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. | Hour | $12.04 | 17 | $204.68 |
| **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. | Hour | $24.81 | 17 | $421.77 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, bare root, 6-18" | 1506 | Bare root hardwood trees 6-18" tall. Includes materials and shipping only. | Each | $0.46 | 2000 | $920.00 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 2000 | $180.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #4 - Low Density Hand Plant w Tubes

**Scenario Description:**

This practice involves planting of 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. Newly planted hardwood seedlings are protected from browsing by installing open tree tubes. Trees are planted at 15 foot spacing or greater. Terrain is moderate 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)

**Before Situation:**

The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the lose of the native forest ecosystem (organic matter in top soil depleted). The main resource concern is degraded plant condition and inadequate structure and composition

**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. All planted trees have vexar tubes, or similar, installed to protect from animal damage. A maximum planting density of 200 trees per acre is required for the site.

**Feature Measure:** Area of Treatment

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $17,761.22

**Scenario Cost/Unit:** $1,776.12

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 17 | $409.36 |
| 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. | Hour | $7.12 | 17 | $121.04 |
| 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. | Hour | $12.04 | 50 | $602.00 |
| **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. | Hour | $24.81 | 50 | $1,240.50 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 2000 | $1,220.00 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 2000 | $10,240.00 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 2000 | $3,140.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #6 - High Density, Mechanical Plant

**Scenario Description:**

This practice applies to forestlands that are being actively managed. Seedlings selected are appropriate for the site and site conditions. 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. Trees are planted at 10 foot spacing or less. Terrain conditions allow for mechanical tree planting. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

The land lacks forest cover or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss organic matter in top soil. Resource concerns are degraded plant condition (including undesirable plant productivity and health, and inadequate structure) and composition and degraded wildlife habitat.

**After Situation:**

10 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. A density of 436 trees per acre or greater is required for the site.

**Feature Measure:** area of treatment

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $4,253.77

**Scenario Cost/Unit:** $425.38

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 9 | $216.72 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 9 | $246.42 |
| 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. | Hour | $7.12 | 9 | $64.08 |
| 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. | Hour | $6.84 | 9 | $61.56 |
| **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. | Hour | $24.81 | 18 | $446.58 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 9 | $226.62 |
| 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. | Hour | $49.27 | 9 | $443.43 |
| **Materials** | | | | | | |
| Tree, conifer, seedling, bare root, 1-1 | 1513 | Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only. | Each | $0.41 | 4360 | $1,787.60 |
| **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 | $190.19 | 4 | $760.76 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #7 - High Density,Mechanical plant with tubes

**Scenario Description:**

Improving the hardwood forest setting by hand planting hardwood tree seedlings. Prior to planting any needed vegetation control will be conducted first. Seedlings are protected from deer browsing. Trees are planted at 10 foot spacing or less. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Resource concerns are degrade plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation.

**After Situation:**

The area of treatment is 10 acres. Bare root hardwood seedlings are planted by hand in the best locations for seedling survival. Solid tree tubes are installed to protect seedlings from animal browsing damage. Post planting vegetation control is planned to ensure seedling survival. A density of 436 trees per acre or greater is required for the site.

**Feature Measure:** Area of Treatment

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $36,621.06

**Scenario Cost/Unit:** $3,662.11

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 9 | $216.72 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 9 | $246.42 |
| 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. | Hour | $7.12 | 9 | $64.08 |
| 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. | Hour | $6.84 | 9 | $61.56 |
| **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. | Hour | $24.81 | 82 | $2,034.42 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 9 | $226.62 |
| 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. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 4360 | $2,659.60 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 4360 | $22,323.20 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 4360 | $6,845.20 |
| **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 | $190.19 | 4 | $760.76 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #8 - High Density, Hand Plant

**Scenario Description:**

This practice involves planting of 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. Terrain is moderate to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Trees are planted at 10 foot spacing or less. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

The land has a little/no tree cover. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the lose of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition

**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. A density of 436 trees per acre or greater is required for the site. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** Area of Treatment

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,987.08

**Scenario Cost/Unit:** $398.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 12 | $288.96 |
| 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. | Hour | $7.12 | 12 | $85.44 |
| 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. | Hour | $12.04 | 12 | $144.48 |
| **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. | Hour | $24.81 | 36 | $893.16 |
| 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. | Hour | $49.27 | 12 | $591.24 |
| **Materials** | | | | | | |
| Tree, conifer, seedling, bare root, 1-1 | 1513 | Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only. | Each | $0.41 | 4360 | $1,787.60 |
| Wire flags | 1586 | Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows | Each | $0.09 | 2180 | $196.20 |

**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::** Acre

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $8,621.02

**Scenario Cost/Unit:** $1,724.20

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| 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. | Hour | $7.12 | 16 | $113.92 |
| 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. | Hour | $12.04 | 30 | $361.20 |
| **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. | Hour | $24.81 | 30 | $744.30 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal. | 1531 | Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.54 | 600 | $2,724.00 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 600 | $3,072.00 |
| Stakes, wood, 3/4" x 3/4" x 36" | 1581 | 3/4" x 3/4" x 36" wood stakes to fasten items in place. Includes materials only. | Each | $0.72 | 600 | $432.00 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #10 - High Density, Hand Plant, Tubes

**Scenario Description:**

This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. Tree tubes are employed to minimize deer browsing. The productivity of the site is good and will handle a high density planting rate. Terrain is moderate to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Trees are planted at 10 foot spacing or less. Associated Practices: Mulching (484), Tree & Shrub Site Preparation (490)

**Before Situation:**

The land has a little/no tree cover. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Resource concerns are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat.

**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. A density of 436 trees per acre or greater is required for the site. Establishing forest vegetation also creates corridors for wildlife movement.

**Feature Measure:** Area of planting

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $38,097.81

**Scenario Cost/Unit:** $3,809.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 28 | $674.24 |
| 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. | Hour | $7.12 | 28 | $199.36 |
| 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. | Hour | $12.04 | 109 | $1,312.36 |
| **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. | Hour | $24.81 | 109 | $2,704.29 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 28 | $1,379.56 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 4360 | $2,659.60 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 4360 | $22,323.20 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 4360 | $6,845.20 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #11 - Hand Plant Conifers

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing. 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)

**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 landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. The resource concern is degraded plant condition: inadequate structure and composition, and inadequate wildlife & fish habitat.

**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:** 6,050.0

**Scenario Total Cost:** $4,014.50

**Scenario Cost/Unit:** $0.66

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| 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. | Hour | $7.12 | 8 | $56.96 |
| 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. | Hour | $12.04 | 8 | $96.32 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Tree, conifer, seedling, bare root, 1-1 | 1513 | Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only. | Each | $0.41 | 6050 | $2,480.50 |

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #38 - Tree/Shrub Regeneration Area with Protection

**Scenario Description:**

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 or biologist, 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 from deer and other wildlife, 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 wildlife &fish habitat; 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. Deer pressure has potential to negatively affect regeneration. 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 wildlife &fish habitat.

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $6,143.12

**Scenario Cost/Unit:** $614.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| **Materials** | | | | | | |
| Wire, Woven, Wildlife, 96" | 6 | High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only. | Each | $455.40 | 8 | $3,643.20 |
| Post, Wood, CCA treated, 6" x 12-14' | 13 | Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only. | Each | $26.98 | 20 | $539.60 |
| Post, Steel T, 1.33 lbs, 10' | 17 | Steel Post, Studded 10' - 1.33 lb. Includes materials and shipping only. | Each | $10.93 | 20 | $218.60 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Foot | $0.12 | 2704 | $324.48 |
| Property/Safety Signs | 293 | Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5" x 4.75". Includes materials and shipping only. | Each | $1.53 | 25 | $38.25 |
| Gate, Game, 8' High X 4' | 1082 | 4' Wide Game Gate (8' Tall). Includes materials and shipping only. | Each | $202.24 | 1 | $202.24 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 612 - Tree/Shrub Establishment

**Scenario** #40 - Tree/shrub Planted Area with Protection

**Scenario Description:**

Tree seedlings will be hand planted in a forested area where few or no forest trees are currently growing. When implemented with the guidance of a professional forester, a well-stocked stand of a predetermined species composition will result. Standard forestry measures are used to provide temporary protection for planted trees, to improve the likelihood of successful establishment 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. Resource concerns include: Degraded Plant Condition - Inadequate structure and composition, Undesirable plant productivity and health, and/or Inadequate wildlife & fish habitat; 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 tree planting along with temporary protection will be needed. Primary resource concerns are Degraded Plant Condition - Inadequate structure and composition and Inadequate wildlife & fish habitat.

**After Situation:**

Trees have been successfully established on 10 acres of forest land. The regrowing 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

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $9,911.83

**Scenario Cost/Unit:** $991.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 15 | $361.20 |
| 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. | Hour | $7.12 | 15 | $106.80 |
| **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. | Hour | $24.81 | 30 | $744.30 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 32 | $793.92 |
| 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. | Hour | $49.27 | 15 | $739.05 |
| **Materials** | | | | | | |
| Wire, Woven, Wildlife, 96" | 6 | High Tensile 12.5 gauge, 96" - 330' roll. Includes materials and shipping only. | Each | $455.40 | 8 | $3,643.20 |
| Post, Wood, CCA treated, 6" x 12-14' | 13 | Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only. | Each | $26.98 | 20 | $539.60 |
| Post, Steel T, 1.33 lbs, 10' | 17 | Steel Post, Studded 10' - 1.33 lb. Includes materials and shipping only. | Each | $10.93 | 20 | $218.60 |
| Fence, Wire Assembly, Woven Wire | 35 | Brace pins, twist sticks, staples. Includes materials and shipping only. | Foot | $0.12 | 2704 | $324.48 |
| Property/Safety Signs | 293 | Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5" x 4.75". Includes materials and shipping only. | Each | $1.53 | 25 | $38.25 |
| Gate, Game, 8' High X 4' | 1082 | 4' Wide Game Gate (8' Tall). Includes materials and shipping only. | Each | $202.24 | 1 | $202.24 |
| Tree, hardwood, seedling or transplant, bare root, 6-18" | 1509 | Bare root hardwood trees 6-18" tall. Includes materials and shipping only. | Each | $0.67 | 3000 | $2,010.00 |
| **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 | $190.19 | 1 | $190.19 |

**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:** 1.0

**Scenario Total Cost:** $1,445.33

**Scenario Cost/Unit:** $1,445.33

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 Yard | $502.23 | 0.3 | $150.67 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 11.1 | $30.75 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 2 | $123.92 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1.85 | $57.81 |
| Tank, Freeze Proof, 2 hole | 280 | Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping. | Each | $699.42 | 1 | $699.42 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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:** 1.0

**Scenario Total Cost:** $1,551.81

**Scenario Cost/Unit:** $1,551.81

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 | $2.77 | 11.1 | $30.75 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 2 | $123.92 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1.85 | $57.81 |
| Tank, Concrete, 500 gallon | 1049 | Concrete tank for water storage, with riser and lid. Includes materials and delivery | Each | $956.57 | 1 | $956.57 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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:** 1.0

**Scenario Total Cost:** $145.28

**Scenario Cost/Unit:** $145.28

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. | Hour | $24.81 | 1 | $24.81 |
| **Materials** | | | | | | |
| Tank, Polyethylene, 100 gallon | 290 | Portable heavy duty rubber stock tank. | Each | $96.31 | 1 | $96.31 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $24.16 | 1 | $24.16 |

**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:** 1.0

**Scenario Total Cost:** $223.87

**Scenario Cost/Unit:** $223.87

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. | Hour | $24.81 | 1 | $24.81 |
| **Materials** | | | | | | |
| Freeze Proof Hydrant, <= 3' Bury | 240 | Freeze Proof Hydrant, 3 foot or less bury. Materials only. | Each | $78.59 | 1 | $78.59 |
| Tank, Polyethylene, 100 gallon | 290 | Portable heavy duty rubber stock tank. | Each | $96.31 | 1 | $96.31 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $24.16 | 1 | $24.16 |

**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:** 1.0

**Scenario Total Cost:** $1,495.24

**Scenario Cost/Unit:** $1,495.24

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 | $2.77 | 11.1 | $30.75 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 2 | $123.92 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 1.85 | $57.81 |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallon | $0.90 | 1000 | $900.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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:** 5.0

**Scenario Total Cost:** $948.12

**Scenario Cost/Unit:** $189.62

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. | Hour | $8.08 | 2 | $16.16 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **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. | Hour | $44.32 | 8 | $354.56 |
| **Materials** | | | | | | |
| Freeze Proof Hydrant, <= 3' Bury | 240 | Freeze Proof Hydrant, 3 foot or less bury. Materials only. | Each | $78.59 | 5 | $392.95 |
| Tank, Polyethylene, 100 gallon | 290 | Portable heavy duty rubber stock tank. | Each | $96.31 | 1 | $96.31 |
| Post, Wood, CCA Treated, 4-5" X 7' | 1050 | Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only. | Each | $7.98 | 5 | $39.90 |
| Tank, Float Valve Assembly | 1077 | Float Valve, Stem, Swivel, Float Ball | Each | $24.16 | 1 | $24.16 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 620 - Underground Outlet

**Scenario** #1 - UO 6" 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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $3,895.91

**Scenario Cost/Unit:** $7.79

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 Yard | $2.77 | 170 | $470.90 |
| 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 Yard | $1.86 | 170 | $316.20 |
| **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. | Hour | $24.81 | 6 | $148.86 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Pipe, PVC, 6", SDR 35 | 993 | Materials: - 6" - PVC - SDR 35 - ASTM D3034 | Foot | $4.53 | 500 | $2,265.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 620 - Underground Outlet

**Scenario** #2 - UO 6" 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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $3,963.30

**Scenario Cost/Unit:** $7.93

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 Yard | $2.77 | 210 | $581.70 |
| 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 Yard | $2.39 | 2 | $4.78 |
| **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. | Hour | $24.81 | 6 | $148.86 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Pipe, PVC, 6", SDR 35 | 993 | Materials: - 6" - PVC - SDR 35 - ASTM D3034 | Foot | $4.53 | 500 | $2,265.00 |
| Inlet, riser, 8" | 1262 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8" diameter. Materials only. | Each | $109.37 | 2 | $218.74 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 620 - Underground Outlet

**Scenario** #3 - UO 8" to 12"

**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 similar 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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $5,023.54

**Scenario Cost/Unit:** $10.05

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 Yard | $2.77 | 210 | $581.70 |
| 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 Yard | $1.86 | 210 | $390.60 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 10" | 1243 | Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only. | Foot | $6.02 | 500 | $3,010.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 620 - Underground Outlet

**Scenario** #4 - UO 8" to 12" 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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $5,784.60

**Scenario Cost/Unit:** $11.57

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 Yard | $2.77 | 420 | $1,163.40 |
| 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 Yard | $2.39 | 2 | $4.78 |
| **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. | Hour | $24.81 | 9 | $223.29 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 10" | 1243 | Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only. | Foot | $6.02 | 500 | $3,010.00 |
| Inlet, riser, 12" | 1264 | Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 12" diameter. Materials only. | Each | $540.37 | 1 | $540.37 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 620 - Underground Outlet

**Scenario** #5 - UO 15" to 18"

**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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $10,750.60

**Scenario Cost/Unit:** $21.50

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 Yard | $2.77 | 330 | $914.10 |
| 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 Yard | $1.86 | 330 | $613.80 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 60 | $1,875.00 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 18" | 1245 | Pipe, Corrugated HDPE Double Wall, 18" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $12.81 | 500 | $6,405.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 620 - Underground Outlet

**Scenario** #6 - UO 21" to 24"

**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 similar 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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $17,269.30

**Scenario Cost/Unit:** $34.54

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 Yard | $2.77 | 445 | $1,232.65 |
| 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 Yard | $1.86 | 445 | $827.70 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 85 | $2,656.25 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24" | 1246 | Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $23.22 | 500 | $11,610.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 620 - Underground Outlet

**Scenario** #7 - UO 27" to 30"

**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 similar 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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $21,819.90

**Scenario Cost/Unit:** $43.64

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 Yard | $2.77 | 565 | $1,565.05 |
| 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 Yard | $1.86 | 565 | $1,050.90 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 105 | $3,281.25 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 30" | 1247 | Pipe, Corrugated HDPE Double Wall, 30" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $29.96 | 500 | $14,980.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 620 - Underground Outlet

**Scenario** #8 - UO over 30"

**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 similar 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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $27,715.39

**Scenario Cost/Unit:** $55.43

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 Yard | $2.77 | 690 | $1,911.30 |
| 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 Yard | $1.86 | 690 | $1,283.40 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 135 | $4,218.75 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 36" | 1248 | Pipe, Corrugated HDPE Double Wall, 36" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $38.52 | 500 | $19,260.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 underground 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 similar 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 contaminated 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $18,206.90

**Scenario Cost/Unit:** $36.41

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. | Hour | $61.96 | 4 | $247.84 |
| Horizontal Boring, Greater Than 3" diameter | 1132 | Includes equipment, labor and setup. | Foot | $94.86 | 100 | $9,486.00 |
| 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 Yard | $2.77 | 134 | $371.18 |
| 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 Yard | $1.86 | 134 | $249.24 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 12 | $591.24 |
| **Materials** | | | | | | |
| Rock Riprap, Placed with geotextile | 44 | Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place | Cubic Yard | $80.12 | 1 | $80.12 |
| Pipe, PVC, 8", SDR 26 | 991 | Materials: - 8" - PVC - SDR 26 160 psi - ASTM D2241 | Foot | $10.79 | 550 | $5,934.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 3 | $848.34 |

**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 Foot

**Scenario Typical Size:** 45,239.0

**Scenario Total Cost:** $35,042.60

**Scenario Cost/Unit:** $0.77

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Brush Chipper, 6" capacity | 938 | Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hour | $23.48 | 40 | $939.20 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 16 | $1,020.48 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| **Materials** | | | | | | |
| Straw | 1237 | Small grain straw (non organic and certified organic). Includes materials only. | Ton | $128.33 | 242.8 | $31,158.52 |
| **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 | $190.19 | 8 | $1,521.52 |

**Practice:** 630 - Vertical Drain

**Scenario** #1 - Sand Filled Pit

**Scenario Description:**

A vertical shaft such as a well, pipe, pit or bore, drilled into a permeable substratum into which surface and subsurface drainage water is channeled. In this case, a pit will be installed with sand backfill. Associated practices: Filter strips (393), Grassed Waterway (412), and Sediment Basins (350) will be used as needed to provide suitable filtering and removing of sediment from water before entering well. Other associated practices are Critical area planting (342), Fence (382), Diversion (362), Open Channel (582), Subsurface Drain (606), Lined Waterway (468), Underground Outlet (620).

**Before Situation:**

A depressional area lacks adequate drainage leading to flooding and ponding water. Surface water is being contaminated with pesticide, nutrients and sediment. Resource concerns include excessive nutrients and organics in surface water, harmful levels of pesticides in surface water, classic gully soil erosion, excessive runoff, flooding or ponding, inadequate outlets and aquifer overdraft.

**After Situation:**

Installation of 12' x 12' x 4' deep pit with sand backfill. The vertical drain will provide adequate outlet for drainage water, protect surface water quality and provide control of erosion due to surface runoff into a depressional area. Associated practices Filter strips (393), Grassed Waterway (412), and Sediment Basins (350) will be used as needed to provide suitable filtering and removing of sediment from water before entering well. Other associated practices are Critical area planting (342), Fence (382), Diversion (362), Open Channel (582), Subsurface Drain (606), Lined Waterway (468), Underground Outlet (620).

**Feature Measure:** Vertical Drain

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,656.05

**Scenario Cost/Unit:** $1,656.05

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. | Hour | $73.10 | 1 | $73.10 |
| 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. | Hour | $125.73 | 2 | $251.46 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 3 | $118.29 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 21 | $647.64 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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:** 1.0

**Scenario Total Cost:** $36,237.82

**Scenario Cost/Unit:** $36,237.82

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 Yard | $322.92 | 10 | $3,229.20 |
| **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. | Hour | $44.32 | 16 | $709.12 |
| 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. | Hour | $24.81 | 32 | $793.92 |
| **Materials** | | | | | | |
| Vibratory or Rotating Screen | 1948 | Vibratory or Rotating Screen, includes materials, shipping and equipment. | Each | $30,325.37 | 1 | $30,325.37 |
| **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 | $78.09 | 3 | $234.27 |
| 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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 632 - Waste Separation Facility

**Scenario** #2 - Mechanical Seperation 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:** 1.0

**Scenario Total Cost:** $58,590.07

**Scenario Cost/Unit:** $58,590.07

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 Yard | $322.92 | 12 | $3,875.04 |
| **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. | Hour | $44.32 | 16 | $709.12 |
| 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. | Hour | $24.81 | 32 | $793.92 |
| **Materials** | | | | | | |
| Screw or Roller Press - Small | 1950 | Screw or Roller Press with a capacity of < 100 GPM. Includes materials and equipment. | Each | $43,200.00 | 1 | $43,200.00 |
| Electronic Control Panel with Ultra Sonic and Pressure Sensor | 2581 | Electronic programmable control panel for screw press solid separators; Includes materials only. | Each | $8,831.78 | 1 | $8,831.78 |
| **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 | $78.09 | 3 | $234.27 |
| 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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 24.0

**Scenario Total Cost:** $1,428.87

**Scenario Cost/Unit:** $59.54

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 Yard | $322.92 | 1 | $322.92 |
| 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 Yard | $502.23 | 1 | $502.23 |
| 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 Yard | $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 Yard | $1.76 | 11 | $19.36 |
| 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 Yard | $2.39 | 30 | $71.70 |
| **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. | Hour | $44.32 | 4 | $177.28 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 0.5 | $15.63 |
| Pipe, PVC, 6", SDR 35 | 993 | Materials: - 6" - PVC - SDR 35 - ASTM D3034 | Foot | $4.53 | 4 | $18.12 |
| Wire Mesh Screen, galvanized, 1/16 in | 1229 | Wire Mesh Screen, galvanized, 1/16 inch grid spacing. Materials only. | Square Foot | $4.11 | 24 | $98.64 |
| **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 | $190.19 | 1 | $190.19 |

**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:** 1.0

**Scenario Total Cost:** $495.26

**Scenario Cost/Unit:** $495.26

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. | Hour | $49.27 | 4 | $197.08 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Test, Manure Analysis | 306 | Moisture, Total N, P, K. Includes materials and shipping only. | Each | $44.78 | 2 | $89.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Gallon

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $6,977.71

**Scenario Cost/Unit:** $6.98

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 Yard | $322.92 | 4 | $1,291.68 |
| 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 Yard | $502.23 | 2 | $1,004.46 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Pipe, PVC, 6", SCH 40 | 980 | Materials: - 6" - PVC - SCH 40 - ASTM D1785 | Foot | $6.16 | 150 | $924.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 5 | $107.75 |
| Catch Basin, concrete, 60" dia. | 1754 | Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only. | Each | $2,161.76 | 1 | $2,161.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Gallon

**Scenario Typical Size:** 4,300.0

**Scenario Total Cost:** $13,932.64

**Scenario Cost/Unit:** $3.24

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 Yard | $322.92 | 6 | $1,937.52 |
| 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 Yard | $502.23 | 14 | $7,031.22 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 12 | $743.52 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 3 | $38.58 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| 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. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Pipe, PVC, 6", SDR 35 | 993 | Materials: - 6" - PVC - SDR 35 - ASTM D3034 | Foot | $4.53 | 150 | $679.50 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 12 | $258.60 |
| 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. | Foot | $2.86 | 40 | $114.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 634 - Waste Transfer

**Scenario** #3 - Inlet and Reception pit, over 5000 gal

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume greater than 5000 gallons such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this pit is intended to be transferred to final storage within a 48 hour period. 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 conduit. 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 maximum design volume for wastewater collected is greater than 5000 gallons of liquid waste within 48 hours or before it is stored or treated. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters inlet area to collect liquid slurry waste and the installation of an 12 ft wide x 16 ft long x 6 ft deep 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 transfer to final location. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Feature Measure:** Collection volume installed

**Scenario Unit::** Gallon

**Scenario Typical Size:** 8,600.0

**Scenario Total Cost:** $25,896.21

**Scenario Cost/Unit:** $3.01

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 Yard | $322.92 | 11 | $3,552.12 |
| 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 Yard | $502.23 | 22 | $11,049.06 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 32 | $1,982.72 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 12 | $877.20 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 16 | $1,020.48 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 4 | $51.44 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 28 | $705.04 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 32 | $1,261.76 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 15 | $323.25 |
| 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. | Foot | $2.86 | 60 | $171.60 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 634 - Waste Transfer

**Scenario** #4 - Medium collection basin with 6" 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::** Gallon

**Scenario Typical Size:** 4,300.0

**Scenario Total Cost:** $21,260.64

**Scenario Cost/Unit:** $4.94

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 Yard | $322.92 | 6 | $1,937.52 |
| 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 Yard | $502.23 | 14 | $7,031.22 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 32 | $1,982.72 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 8 | $584.80 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 16 | $1,020.48 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 3 | $38.58 |
| **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. | Hour | $24.81 | 96 | $2,381.76 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 24 | $604.32 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 32 | $1,261.76 |
| 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. | Hour | $49.27 | 32 | $1,576.64 |
| **Materials** | | | | | | |
| Pipe, PVC, 6", SDR 41 | 984 | Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241 | Foot | $4.22 | 330 | $1,392.60 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 18 | $387.90 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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. | Foot | $2.86 | 40 | $114.40 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Gallon

**Scenario Typical Size:** 8,600.0

**Scenario Total Cost:** $33,803.41

**Scenario Cost/Unit:** $3.93

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 Yard | $322.92 | 11 | $3,552.12 |
| 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 Yard | $502.23 | 22 | $11,049.06 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 40 | $2,478.40 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 12 | $877.20 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 24 | $1,530.72 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 4 | $51.44 |
| **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. | Hour | $24.81 | 140 | $3,473.40 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 36 | $906.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 40 | $1,577.20 |
| 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. | Hour | $49.27 | 40 | $1,970.80 |
| **Materials** | | | | | | |
| Pipe, PVC, 6", SDR 41 | 984 | Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241 | Foot | $4.22 | 220 | $928.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pipe, PVC, 8", SDR 41 | 985 | Materials: - 8" - PVC - SDR 41 100 psi - ASTM D2241 | Foot | $6.90 | 550 | $3,795.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 23 | $495.65 |
| 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. | Foot | $2.86 | 60 | $171.60 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $17,006.31

**Scenario Cost/Unit:** $14.17

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 Yard | $322.92 | 26 | $8,395.92 |
| 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 Yard | $502.23 | 11 | $5,524.53 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 12 | $743.52 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 4 | $51.44 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 26 | $560.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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:** 1.0

**Scenario Total Cost:** $3,888.22

**Scenario Cost/Unit:** $3,888.22

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 Yard | $322.92 | 6 | $1,937.52 |
| 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 Yard | $502.23 | 2 | $1,004.46 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 2 | $123.92 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 2 | $50.36 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 4 | $125.00 |
| 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' tall with openings that will not pass a 6" or larger sphere. Includes materials only. | Foot | $15.43 | 14 | $216.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 Foot

**Scenario Typical Size:** 720.0

**Scenario Total Cost:** $10,433.85

**Scenario Cost/Unit:** $14.49

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 Yard | $322.92 | 14 | $4,520.88 |
| 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 Yard | $502.23 | 7 | $3,515.61 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 8 | $495.68 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 5 | $64.30 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 16 | $344.80 |
| 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' tall with openings that will not pass a 6" or larger sphere. Includes materials only. | Foot | $15.43 | 14 | $216.02 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $29,552.31

**Scenario Cost/Unit:** $24.63

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 Yard | $322.92 | 22 | $7,104.24 |
| 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 Yard | $502.23 | 23 | $11,551.29 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 24 | $1,487.04 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 8 | $584.80 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 4 | $51.44 |
| **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. | Hour | $24.81 | 120 | $2,977.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 60 | $2,956.20 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 28 | $603.40 |
| 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. | Foot | $2.86 | 50 | $143.00 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 1,200.0

**Scenario Total Cost:** $34,624.71

**Scenario Cost/Unit:** $28.85

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 Yard | $322.92 | 22 | $7,104.24 |
| 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 Yard | $502.23 | 23 | $11,551.29 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 45 | $287.10 |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 500 | $1,720.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 24 | $1,487.04 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 8 | $584.80 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 4 | $51.44 |
| **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. | Hour | $24.81 | 150 | $3,721.50 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 60 | $2,956.20 |
| **Materials** | | | | | | |
| Pipe, PVC, 6", SDR 41 | 984 | Materials: - 6" - PVC - SDR 41 100 psi - ASTM D2241 | Foot | $4.22 | 550 | $2,321.00 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 28 | $603.40 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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. | Foot | $2.86 | 50 | $143.00 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 cycle 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::** Gallon

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $16,319.23

**Scenario Cost/Unit:** $16.32

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 Yard | $322.92 | 7 | $2,260.44 |
| 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 Yard | $502.23 | 3 | $1,506.69 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 20 | $1,239.20 |
| Dozer, 80 HP | 929 | Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $73.10 | 4 | $292.40 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 4 | $255.12 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 4 | $51.44 |
| **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. | Hour | $24.81 | 60 | $1,488.60 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 20 | $788.60 |
| 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. | Hour | $49.27 | 30 | $1,478.10 |
| **Materials** | | | | | | |
| Pipe, PVC, 8", SDR 21 | 988 | Materials: - 8" - PVC - SDR 21 200 psi - ASTM D2241 | Foot | $13.23 | 55 | $727.65 |
| Pipe, PVC, 8", SDR 35 | 994 | Materials: - 8" - PVC - SDR 35 - ASTM D3034 | Foot | $8.13 | 220 | $1,788.60 |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallon | $0.90 | 900 | $810.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 15 | $323.25 |
| Catch Basin, concrete, 60" dia. | 1754 | Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only. | Each | $2,161.76 | 1 | $2,161.76 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $18,548.85

**Scenario Cost/Unit:** $61.83

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 Yard | $322.92 | 8 | $2,583.36 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 66 | $421.08 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 30 | $1,858.80 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 8 | $510.24 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 4 | $51.44 |
| **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. | Hour | $24.81 | 70 | $1,736.70 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 30 | $1,182.90 |
| 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. | Hour | $49.27 | 35 | $1,724.45 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 10 | $308.40 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 6 | $129.30 |
| Pipe, PVC, 12", SDR 35 | 1252 | Pipe, PVC, SDR 35, 12" Diameter - ASTM D3034. Material cost only. | Foot | $18.21 | 220 | $4,006.20 |
| Pipe, PVC, 12", SDR 21 | 1717 | Materials: - 12" - PVC - SDR 21 - ASTM D2241 | Foot | $26.26 | 110 | $2,888.60 |
| **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 | $190.19 | 2 | $380.38 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $10,828.43

**Scenario Cost/Unit:** $135.36

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 Yard | $322.92 | 7 | $2,260.44 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 33 | $210.54 |
| 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. | Hour | $125.73 | 12 | $1,508.76 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 4 | $51.44 |
| **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. | Hour | $24.81 | 24 | $595.44 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| 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. | Hour | $49.27 | 12 | $591.24 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 7 | $215.88 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 7 | $150.85 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24" | 1246 | Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $23.22 | 88 | $2,043.36 |
| Catch Basin, concrete, 60" dia. | 1754 | Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only. | Each | $2,161.76 | 1 | $2,161.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 30.0

**Scenario Total Cost:** $5,907.34

**Scenario Cost/Unit:** $196.91

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 Yard | $322.92 | 2 | $645.84 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 15 | $95.70 |
| 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. | Hour | $125.73 | 6 | $754.38 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 3 | $38.58 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 6 | $236.58 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 2 | $61.68 |
| Aggregate, Gravel, Ungraded, Quarry Run | 1099 | Includes materials, equipment and labor | Cubic Yard | $21.55 | 4 | $86.20 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24" | 1246 | Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $23.22 | 33 | $766.26 |
| Catch Basin, concrete, 60" dia. | 1754 | Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only. | Each | $2,161.76 | 1 | $2,161.76 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 150.0

**Scenario Total Cost:** $13,965.13

**Scenario Cost/Unit:** $93.10

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 Yard | $502.23 | 1 | $502.23 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 57 | $363.66 |
| 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. | Hour | $181.78 | 30 | $5,453.40 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 5 | $64.30 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 13 | $400.92 |
| Pipe, HDPE, CPT, Double Wall, Soil Tight, 24" | 1246 | Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only. | Foot | $23.22 | 160 | $3,715.20 |
| **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 | $539.90 | 1 | $539.90 |

**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::** Foot

**Scenario Typical Size:** 300.0

**Scenario Total Cost:** $11,298.64

**Scenario Cost/Unit:** $37.66

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 Yard | $2.56 | 97 | $248.32 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 56 | $357.28 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 24 | $1,487.04 |
| Demolition, concrete | 1498 | Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment. | Cubic Yard | $12.86 | 7 | $90.02 |
| **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. | Hour | $24.81 | 24 | $595.44 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 24 | $604.32 |
| 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. | Hour | $49.27 | 24 | $1,182.48 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 14 | $431.76 |
| Pipe, PVC, 12", SCH 40 | 1716 | Materials: 12" dia. PVC SCH 40, ASTM D1785 | Foot | $18.24 | 330 | $6,019.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $27,464.06

**Scenario Cost/Unit:** $27.46

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 Yard | $159.14 | 1 | $159.14 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 127 | $810.26 |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1000 | $3,440.00 |
| **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. | Hour | $24.81 | 70 | $1,736.70 |
| 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. | Hour | $49.27 | 20 | $985.40 |
| **Materials** | | | | | | |
| Pipe, PVC, 10", SDR 21 | 1714 | Materials: - 10" - PVC - SDR 21 - ASTM D2241 | Foot | $17.97 | 1100 | $19,767.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $15,541.44

**Scenario Cost/Unit:** $15.54

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 Yard | $159.14 | 1 | $159.14 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 90 | $574.20 |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1000 | $3,440.00 |
| **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. | Hour | $24.81 | 70 | $1,736.70 |
| 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. | Hour | $49.27 | 20 | $985.40 |
| **Materials** | | | | | | |
| Pipe, PVC, 6", SDR 21 | 987 | Materials: - 6" - PVC - SDR 21 200 psi - ASTM D2241 | Foot | $7.86 | 1100 | $8,646.00 |

**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 for 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 applicator or 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::** Foot

**Scenario Typical Size:** 500.0

**Scenario Total Cost:** $4,650.03

**Scenario Cost/Unit:** $9.30

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 45 | $287.10 |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 375 | $1,290.00 |
| **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. | Hour | $24.81 | 35 | $868.35 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Pipe, PVC, 4", SDR 21 | 986 | Materials: - 4" - PVC - SDR 21 200 psi - ASTM D2241 | Foot | $3.65 | 550 | $2,007.50 |

**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:** 1.0

**Scenario Total Cost:** $11,801.81

**Scenario Cost/Unit:** $11,801.81

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. | Hour | $44.32 | 11 | $487.52 |
| **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 | $11,314.29 | 1 | $11,314.29 |

**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:** 1.0

**Scenario Total Cost:** $18,397.93

**Scenario Cost/Unit:** $18,397.93

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. | Hour | $44.32 | 12 | $531.84 |
| **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 | $17,485.71 | 1 | $17,485.71 |
| **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 | $190.19 | 2 | $380.38 |

**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:** 1.0

**Scenario Total Cost:** $26,811.69

**Scenario Cost/Unit:** $26,811.69

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. | Hour | $44.32 | 12 | $531.84 |
| **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 | $25,714.29 | 1 | $25,714.29 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 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:** 1.0

**Scenario Total Cost:** $6,521.73

**Scenario Cost/Unit:** $6,521.73

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 Yard | $322.92 | 1 | $322.92 |
| 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 Yard | $502.23 | 1 | $502.23 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 40 | $255.20 |
| Trenching, Earth, clay, 24" x 48" | 55 | Trenching, earth, clay, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling and shoring/dewatering | Foot | $4.06 | 150 | $609.00 |
| 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. | Hour | $125.73 | 6 | $754.38 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 6 | $151.08 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 150 | $523.50 |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallon | $0.90 | 750 | $675.00 |
| Collection box, with grate lid | 1755 | Precast concrete box with grate lid for waste transfer sump. Typically 1000-2000 gallon capacity. Materials only. | Each | $1,945.59 | 1 | $1,945.59 |
| **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 | $190.19 | 1 | $190.19 |

**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 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 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:** 1.0

**Scenario Total Cost:** $2,429.25

**Scenario Cost/Unit:** $2,429.25

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 Yard | $322.92 | 1 | $322.92 |
| 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 Yard | $502.23 | 1 | $502.23 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 1 | $61.96 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1 | $25.18 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 300 | $1,047.00 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 underground 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 similar 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 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 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::** Foot

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $12,208.74

**Scenario Cost/Unit:** $122.09

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. | Hour | $61.96 | 4 | $247.84 |
| Horizontal Boring, Greater Than 3" diameter | 1132 | Includes equipment, labor and setup. | Foot | $94.86 | 100 | $9,486.00 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 4 | $157.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Pipe, PVC, 8", SDR 21 | 988 | Materials: - 8" - PVC - SDR 21 200 psi - ASTM D2241 | Foot | $13.23 | 110 | $1,455.30 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 5,000.0

**Scenario Total Cost:** $57,674.81

**Scenario Cost/Unit:** $11.53

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. | Hour | $24.81 | 1 | $24.81 |
| **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 Foot | $11.53 | 5000 | $57,650.00 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $33,384.81

**Scenario Cost/Unit:** $33.38

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. | Hour | $24.81 | 1 | $24.81 |
| **Materials** | | | | | | |
| Hard Hose and Reel System, >3" dia. | 2442 | Hard hose and reel system with > 3" nominal size hose. This includes the hard hose and reel only. Normal hose length 1320'. | Foot | $33.36 | 1000 | $33,360.00 |

**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::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $12,842.20

**Scenario Cost/Unit:** $12.84

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 Yard | $4.83 | 300 | $1,449.00 |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 1000 | $3,440.00 |
| **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. | Hour | $24.81 | 80 | $1,984.80 |
| 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. | Hour | $49.27 | 20 | $985.40 |
| **Materials** | | | | | | |
| Pipe, PVC, 6", SDR 35 | 993 | Materials: - 6" - PVC - SDR 35 - ASTM D3034 | Foot | $4.53 | 1100 | $4,983.00 |

**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::** Foot

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $1,667.40

**Scenario Cost/Unit:** $8.34

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 Yard | $4.83 | 60 | $289.80 |
| Trenching, Earth, loam, 24" x 48" | 54 | Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $3.44 | 200 | $688.00 |
| **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. | Hour | $24.81 | 6 | $148.86 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Pipe, PVC, 4", SDR 35 | 992 | Materials: - 4" - PVC - SDR 35 - ASTM D3034 | Foot | $2.01 | 220 | $442.20 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 3,840.0

**Scenario Total Cost:** $31,788.00

**Scenario Cost/Unit:** $8.28

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 Yard | $322.92 | 12 | $3,875.04 |
| 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 Yard | $502.23 | 36 | $18,080.28 |
| Earthfill, Manually Compacted | 50 | Earthfill, manually compacted, includes equipment and labor | Cubic Yard | $6.38 | 150 | $957.00 |
| 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. | Hour | $125.73 | 14 | $1,760.22 |
| 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 | Hour | $182.75 | 9 | $1,644.75 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 14 | $552.02 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 12 | $375.00 |
| Aggregate, gravel, washed, pea gravel | 1331 | Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry. | Cubic Yard | $34.45 | 16 | $551.20 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 6" | 2202 | Pipe, Corrugated HDPE Double Wall 6" diameter with water tight joints meeting ASTM F477. Material cost only. | Foot | $2.60 | 104 | $270.40 |
| **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 | $78.09 | 3 | $234.27 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Mobilization, large equipment | 1140 | Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | $539.90 | 5 | $2,699.50 |

**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 Foot

**Scenario Typical Size:** 43,560.0

**Scenario Total Cost:** $13,643.95

**Scenario Cost/Unit:** $0.31

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 Yard | $322.92 | 2 | $645.84 |
| 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 Yard | $502.23 | 12 | $6,026.76 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 400 | $1,108.00 |
| 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 Yard | $2.56 | 100 | $256.00 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 1 | $12.32 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 6 | $185.04 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 70 | $2,187.50 |
| 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 | $0.60 | 30 | $18.00 |
| 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 | $0.64 | 30 | $19.20 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 30 | $10.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 2 | $186.46 |
| Pipe, PVC, 2", SCH 40 | 976 | Materials: - 2" - PVC - SCH 40 - ASTM D1785 | Foot | $1.34 | 45 | $60.30 |
| Ball Valve, 4" | 1726 | 4" ball valve, metal body. Materials only. | Each | $320.66 | 2 | $641.32 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Coupling, PVC, endcap, 2", SCH 20 | 1727 | 2" - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $1.82 | 15 | $27.30 |
| Pipe, PE, 6", DR 9, perforated | 1728 | Materials: -6" - Perforated PE- 160 psi - ASTM D3035 DR 9 | Foot | $18.12 | 80 | $1,449.60 |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 1 | $48.34 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 21,780.0

**Scenario Total Cost:** $3,371.55

**Scenario Cost/Unit:** $0.15

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. | Hour | $73.10 | 8 | $584.80 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 0.5 | $6.16 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 0.5 | $3.66 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 0.5 | $11.81 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 0.5 | $4.26 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 37.5 | $1,171.88 |
| 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 | $0.60 | 15 | $9.00 |
| 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 | $0.64 | 15 | $9.60 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 15 | $5.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 1 | $93.23 |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 150 | $523.50 |
| Ball Valve, 4" | 1726 | 4" ball valve, metal body. Materials only. | Each | $320.66 | 2 | $641.32 |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 0.5 | $24.17 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 herbaceous 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 Foot

**Scenario Typical Size:** 22,500.0

**Scenario Total Cost:** $2,817.96

**Scenario Cost/Unit:** $0.13

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. | Hour | $24.81 | 8 | $198.48 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 37.5 | $1,171.88 |
| Pipe, PVC, 4", SCH 40 | 978 | Materials: - 4" - PVC - SCH 40 - ASTM D1785 | Foot | $3.49 | 150 | $523.50 |
| Ball Valve, 4" | 1726 | 4" ball valve, metal body. Materials only. | Each | $320.66 | 2 | $641.32 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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 Foot

**Scenario Typical Size:** 43,560.0

**Scenario Total Cost:** $19,563.73

**Scenario Cost/Unit:** $0.45

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 Yard | $502.23 | 7 | $3,515.61 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 445 | $1,232.65 |
| 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 Yard | $2.56 | 75 | $192.00 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 1935 | $7,662.60 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 1 | $12.32 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 1613 | $1,580.74 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 75 | $2,343.75 |
| 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 | $0.60 | 30 | $18.00 |
| 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 | $0.64 | 30 | $19.20 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 30 | $10.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 2 | $186.46 |
| Pipe, PVC, 2", SCH 40 | 976 | Materials: - 2" - PVC - SCH 40 - ASTM D1785 | Foot | $1.34 | 40 | $53.60 |
| Coupling, PVC, endcap, 2", SCH 20 | 1727 | 2" - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $1.82 | 20 | $36.40 |
| Pipe, PE, 6", DR 9, perforated | 1728 | Materials: -6" - Perforated PE- 160 psi - ASTM D3035 DR 9 | Foot | $18.12 | 100 | $1,812.00 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 1 | $48.34 |
| **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 | $78.09 | 3 | $234.27 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 43,560.0

**Scenario Total Cost:** $48,255.54

**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 Yard | $502.23 | 7 | $3,515.61 |
| Geotextile, woven | 42 | Woven Geotextile Fabric. Includes materials, equipment and labor | Square Yard | $2.77 | 445 | $1,232.65 |
| 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 Yard | $2.56 | 75 | $192.00 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 5808 | $22,999.68 |
| Dozer, 140 HP | 927 | Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included. | Hour | $137.09 | 4 | $548.36 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 1 | $12.32 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 1080 | $1,058.40 |
| 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 Yard | $2.77 | 4840 | $13,406.80 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 75 | $2,343.75 |
| 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 | $0.60 | 30 | $18.00 |
| 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 | $0.64 | 30 | $19.20 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 30 | $10.80 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 2 | $186.46 |
| Pipe, PVC, 2", SCH 40 | 976 | Materials: - 2" - PVC - SCH 40 - ASTM D1785 | Foot | $1.34 | 40 | $53.60 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Coupling, PVC, endcap, 2", SCH 20 | 1727 | 2" - PVC- SCH 40- ASTM D1785 pipe endcaps. Materials only. | Each | $1.82 | 20 | $36.40 |
| Pipe, PE, 6", DR 9, perforated | 1728 | Materials: -6" - Perforated PE- 160 psi - ASTM D3035 DR 9 | Foot | $18.12 | 100 | $1,812.00 |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 1 | $48.34 |
| **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 | $78.09 | 2 | $156.18 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Foot

**Scenario Typical Size:** 150.0

**Scenario Total Cost:** $3,947.92

**Scenario Cost/Unit:** $26.32

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. | Hour | $137.09 | 20 | $2,741.80 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 81 | $79.38 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.08 | $30.09 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.04 | $14.48 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.04 | $10.78 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 20 | $788.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 75.0

**Scenario Total Cost:** $2,466.92

**Scenario Cost/Unit:** $32.89

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. | Hour | $137.09 | 12 | $1,645.08 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 39 | $38.22 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.04 | $15.05 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.02 | $7.24 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.02 | $5.39 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 642 - Water Well

**Scenario** #1 - 4" 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.

**Feature Measure:** Total depth of well

**Scenario Unit::** Foot

**Scenario Typical Size:** 250.0

**Scenario Total Cost:** $6,309.27

**Scenario Cost/Unit:** $25.24

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. | Hour | $375.22 | 6 | $2,251.32 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $44.00 | 1 | $44.00 |
| 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 Yard | $935.78 | 3 | $2,807.34 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallon | $2.76 | 1 | $2.76 |
| Well Cap, 4" | 1785 | Well cap, 4". Materials only. | Each | $25.67 | 1 | $25.67 |
| Well Casing, Metal, 4" | 1809 | Steel well casing, 4". Materials only. | Foot | $8.14 | 110 | $895.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 642 - Water Well

**Scenario** #2 - 4" 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.

**Feature Measure:** Total depth of well

**Scenario Unit::** Foot

**Scenario Typical Size:** 150.0

**Scenario Total Cost:** $3,036.07

**Scenario Cost/Unit:** $20.24

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. | Hour | $375.22 | 4 | $1,500.88 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $44.00 | 1 | $44.00 |
| 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 Yard | $935.78 | 1 | $935.78 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallon | $2.76 | 1 | $2.76 |
| Well Cap, 4" | 1785 | Well cap, 4". Materials only. | Each | $25.67 | 1 | $25.67 |
| Well Casing, Metal, 4" | 1809 | Steel well casing, 4". Materials only. | Foot | $8.14 | 30 | $244.20 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 642 - Water Well

**Scenario** #3 - Typical Well, 6"

**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.

**Feature Measure:** Total depth of well

**Scenario Unit::** Foot

**Scenario Typical Size:** 400.0

**Scenario Total Cost:** $10,225.95

**Scenario Cost/Unit:** $25.56

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. | Hour | $375.22 | 8 | $3,001.76 |
| **Materials** | | | | | | |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $44.00 | 1 | $44.00 |
| 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 Yard | $935.78 | 5 | $4,678.90 |
| Chlorine | 1335 | Liquid chlorine bleach. Includes materials only. | Gallon | $2.76 | 1 | $2.76 |
| Well Cap, 6" | 1786 | Well cap, 6". Materials only. | Each | $33.60 | 1 | $33.60 |
| Well Casing, Metal, 6" | 1810 | Steel well casing, 6". Materials only. | Foot | $14.14 | 150 | $2,121.00 |
| Well Screen, stainless steel, 6" | 1995 | 6" Stainless steel well screen. Materials only. | Foot | $61.15 | 1 | $61.15 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** 643 - Restoration and Management of Rare and Declining Habitats

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $900.76

**Scenario Cost/Unit:** $45.04

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. | Acre | $18.35 | 20 | $367.00 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 6 | $382.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 6 | $151.08 |

**Practice:** 643 - Restoration and Management of Rare and Declining Habitats

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,509.94

**Scenario Cost/Unit:** $125.50

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. | Hour | $214.60 | 6 | $1,287.60 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 20 | $367.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| **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 | $539.90 | 1 | $539.90 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $900.76

**Scenario Cost/Unit:** $45.04

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. | Acre | $18.35 | 20 | $367.00 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 6 | $382.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 6 | $151.08 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,509.94

**Scenario Cost/Unit:** $125.50

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. | Hour | $214.60 | 6 | $1,287.60 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 20 | $367.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| **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 | $539.90 | 1 | $539.90 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,508.24

**Scenario Cost/Unit:** $150.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 3 | $172.14 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 20 | $246.40 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 10 | $183.50 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 10 | $85.10 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 10 | $585.00 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $4,790.90

**Scenario Cost/Unit:** $479.09

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. | Acre | $12.32 | 10 | $123.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 10 | $85.10 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 10 | $3,761.50 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 10 | $585.00 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,029.40

**Scenario Cost/Unit:** $102.94

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. | Acre | $12.32 | 10 | $123.20 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 10 | $85.10 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 10 | $585.00 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $900.76

**Scenario Cost/Unit:** $45.04

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. | Acre | $18.35 | 20 | $367.00 |
| Tractor, agricultural, 120 HP | 962 | Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included. | Hour | $63.78 | 6 | $382.68 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 6 | $151.08 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,509.94

**Scenario Cost/Unit:** $125.50

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. | Hour | $214.60 | 6 | $1,287.60 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 20 | $367.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| **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 | $539.90 | 1 | $539.90 |

**Practice:** 645 - Upland Wildlife Habitat Management

**Scenario** #7 - Grassland Bird Management

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $2,110.08

**Scenario Cost/Unit:** $105.50

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 | $42.52 | 30 | $1,275.60 |
| **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. | Hour | $104.31 | 8 | $834.48 |

**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 identified 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 tillage) 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,157.70

**Scenario Cost/Unit:** $115.77

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. | Acre | $12.32 | 10 | $123.20 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 10 | $73.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 10 | $85.10 |
| **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 | $0.92 | 60 | $55.20 |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 10 | $585.00 |

**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 available for wildlife during the cropping season, 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $4,763.20

**Scenario Cost/Unit:** $476.32

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. | Acre | $12.32 | 10 | $123.20 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 10 | $73.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 5 | $1,880.75 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 5 | $1,809.85 |
| **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 | $0.92 | 60 | $55.20 |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 10 | $585.00 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,733.34

**Scenario Cost/Unit:** $173.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 3 | $172.14 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 20 | $246.40 |
| Tillage, Primary | 946 | Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs. | Acre | $18.35 | 10 | $183.50 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 10 | $73.10 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 10 | $236.10 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 10 | $85.10 |
| **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 | $0.92 | 100 | $92.00 |
| 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 | $0.64 | 60 | $38.40 |
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 60 | $21.60 |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 10 | $585.00 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $395.73

**Scenario Cost/Unit:** $395.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 0.25 | $14.35 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 1 | $12.32 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.5 | $188.08 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.5 | $180.99 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $24.81

**Scenario Cost/Unit:** $24.81

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. | Hour | $24.81 | 1 | $24.81 |

**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 management 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 management of season water, coupled with monitoring, adaptive management from highly trained individuals will fully address the identified 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $285.34

**Scenario Cost/Unit:** $285.34

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Water management, Flooding & dewatering | 969 | Includes equipment and power unit. Labor not included. | Acre Foot | $262.14 | 0.75 | $196.61 |
| **Labor** | | | | | | |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 1 | $24.81 |

**Practice:** 647 - Early Successional Habitat Development/Management

**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 preferred 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 successional 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $1,302.30

**Scenario Cost/Unit:** $130.23

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 10 | $573.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 10 | $251.80 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** 647 - Early Successional Habitat Development/Management

**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::** Acre

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $251.79

**Scenario Cost/Unit:** $50.36

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. | Acre | $12.32 | 5 | $61.60 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** 647 - Early Successional Habitat Development/Management

**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 10 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $12,706.90

**Scenario Cost/Unit:** $1,270.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Feller buncher | 941 | Equipment and power unit costs. Labor not included. | Hour | $129.72 | 60 | $7,783.20 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 60 | $2,365.80 |
| 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. | Hour | $49.27 | 30 | $1,478.10 |
| **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 | $539.90 | 2 | $1,079.80 |

**Practice:** 647 - Early Successional Habitat Development/Management

**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:** 40.0

**Scenario Total Cost:** $954.44

**Scenario Cost/Unit:** $23.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 10 | $48.30 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 10 | $240.80 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $104.31 | 4 | $417.24 |

**Practice:** 647 - Early Successional Habitat Development/Management

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,777.76

**Scenario Cost/Unit:** $1,777.76

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 1 | $4.83 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | $84.38 | 5 | $421.90 |
| **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. | Hour | $24.81 | 1 | $24.81 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 5 | $197.15 |
| 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. | Hour | $49.27 | 1 | $49.27 |
| **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 | $539.90 | 2 | $1,079.80 |

**Practice:** 647 - Early Successional Habitat Development/Management

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $7,536.27

**Scenario Cost/Unit:** $753.63

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 40 | $193.20 |
| Brush Chipper, 6" capacity | 938 | Brush Chipper, 6" capacity, typically 35 HP. Includes chipper and power unit. Labor not included. | Hour | $23.48 | 30 | $704.40 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 3 | $72.24 |
| **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. | Hour | $44.32 | 40 | $1,772.80 |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 20 | $886.40 |
| 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. | Hour | $24.81 | 30 | $744.30 |
| 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. | Hour | $104.31 | 25 | $2,607.75 |
| **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. | Acre | $17.48 | 10 | $174.80 |
| **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 | $190.19 | 2 | $380.38 |

**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 raccoons or snakes.

**After Situation:**

The installation of nesting and rearing boxes support the life-cycle needs of targeted species, 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:** 1.0

**Scenario Total Cost:** $76.23

**Scenario Cost/Unit:** $76.23

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. | Hour | $24.81 | 0.25 | $6.20 |
| **Materials** | | | | | | |
| Habitat Box, Bird | 251 | Bluebird nesting box to increase nesting success. Each is 1-1/2" x 6" x 12-1/2" w/ 1-1/2" diameter opening. Includes materials and shipping. | Each | $30.77 | 1 | $30.77 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $39.26 | 1 | $39.26 |

**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 raccoons or snakes.

**After Situation:**

The installation nesting and rearing boxes support the life-cycle needs of targeted species, 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:** 1.0

**Scenario Total Cost:** $103.74

**Scenario Cost/Unit:** $103.74

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. | Hour | $24.81 | 0.75 | $18.61 |
| **Materials** | | | | | | |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 1 | $15.10 |
| Habitat Box, Bird | 251 | Bluebird nesting box to increase nesting success. Each is 1-1/2" x 6" x 12-1/2" w/ 1-1/2" diameter opening. Includes materials and shipping. | Each | $30.77 | 1 | $30.77 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $39.26 | 1 | $39.26 |

**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:** 1.0

**Scenario Total Cost:** $139.52

**Scenario Cost/Unit:** $139.52

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 0.5 | $15.63 |
| **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. | Hour | $24.81 | 0.5 | $12.41 |
| **Materials** | | | | | | |
| Habitat Box, waterfowl | 1449 | Wood Duck Box, typically 24" x 11" x 12" with 4" wide oval entrance, single. Includes material and shipping only. | Each | $72.22 | 1 | $72.22 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $39.26 | 1 | $39.26 |

## USDA - Natural Resources Conservation Service

**New York**

**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:** 1.0

**Scenario Total Cost:** $212.29

**Scenario Cost/Unit:** $212.29

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. | Hour | $24.81 | 1 | $24.81 |
| **Materials** | | | | | | |
| Pipe, steel, galvanized, threaded, 1 1/4", schedule 40 | 256 | Spec. A-53, includes coupling and clevis hanger assembly sized for covering, 10' OC | Foot | $7.60 | 10 | $76.00 |
| Habitat Box, waterfowl | 1449 | Wood Duck Box, typically 24" x 11" x 12" with 4" wide oval entrance, single. Includes material and shipping only. | Each | $72.22 | 1 | $72.22 |
| Predator Guard | 1461 | Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only. | Each | $39.26 | 1 | $39.26 |

**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:** 1.0

**Scenario Total Cost:** $37.11

**Scenario Cost/Unit:** $37.11

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. | Hour | $24.81 | 0.5 | $12.41 |
| **Materials** | | | | | | |
| Wildlife Escape Ramp | 242 | Pool size 15' x 30', for small mammals less than one pound | Each | $24.70 | 1 | $24.70 |

**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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $218.88

**Scenario Cost/Unit:** $0.17

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 0.5 | $15.63 |
| **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. | Hour | $24.81 | 5 | $124.05 |
| **Materials** | | | | | | |
| Vinyl Undersill Strips | 241 | Marking material using the "undersill" strips of vinyl siding. Priced per foot of fence per each wire. Materials only. | Foot | $0.06 | 1320 | $79.20 |

**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:** 1.0

**Scenario Total Cost:** $37.24

**Scenario Cost/Unit:** $37.24

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. | Hour | $49.30 | 0.5 | $24.65 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 0.5 | $12.59 |

**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:** 1.0

**Scenario Total Cost:** $193.40

**Scenario Cost/Unit:** $193.40

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. | Hour | $49.30 | 1.5 | $73.95 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 1.5 | $7.25 |
| **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. | Hour | $24.81 | 3 | $74.43 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 1.5 | $37.77 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #1 - Sod Release

**Scenario Description:**

Reduce competition from sod around trees/shrubs within a windbreak/shelterbelt. Apply appropriate herbicide to stress or kill competing sod vegetation between and/or within tree/shrub row. A herbicide application is completed to significantly reduce competition from sod (grass) in the windbreak. Associated Practices: Conservation Cover (327), Fence (382), Windbreak/shelterbelt Establishment (380), Hedgerow Planting (422).

**Before Situation:**

1000 feet of livestock shelterbelt, 4 row mix of deciduous and conifer trees/shrubs deteriorating due to being sod bound. Resource concerns: Degrade plant condition-undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter..

**After Situation:**

Integrity of windbreak restored. Domestic animal protection restored.

**Feature Measure:** Length of Renovation

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $370.39

**Scenario Cost/Unit:** $0.37

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. | Acre | $6.78 | 1 | $6.78 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | $104.31 | 1 | $104.31 |
| **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. | Acre | $19.49 | 1 | $19.49 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #2 - Thinning

**Scenario Description:**

Windbreak is thinned by hand w/chainsaw and cut stumps have herbicide applied to prevent undesirable sprouting. Associated Practices: Conservation Cover (327), Fence (382), Windbreak/shelterbelt Establishment (380), Hedgerow Planting (422).

**Before Situation:**

Windbreak functionality has decreased. Windbreak tree and/or shrub species are overly dense and do not provide the desired wind protection. Resource concern is Degrade plant condition- undesirable plant productivity and health.

**After Situation:**

Integrity of windbreak restored, function and health improved.

**Feature Measure:** Length of Renovation

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $690.87

**Scenario Cost/Unit:** $0.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 10 | $48.30 |
| 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. | Hour | $71.74 | 2 | $143.48 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 1 | $42.37 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #3 - Pruning

**Scenario Description:**

Windbreak is pruned by hand (hand tools + chainsaw) to improve shape and form of trees and/or shrubs so that the overall effectiveness of the windbreak will improve. Slash is treated to prevent potential insect, disease, fire and operability problems. Associated Practices: Conservation Cover (327), Fence (382), Windbreak/shelterbelt Establishment (380), Hedgerow Planting (422).

**Before Situation:**

The windbreak tree and or shrub species have become to 'leggy' (grown to tall) or are growing beyond the bounds of the designated windbreak area. Overall density of windbreak is lower than desired optimum. Resource concern is Degrade plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter.

**After Situation:**

Integrity of windbreak restored; impacts of wind reduced. 1,000 feet of windbreaks or shelterbelts

**Feature Measure:** Length of Renovation

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $564.52

**Scenario Cost/Unit:** $0.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 10 | $48.30 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 2 | $9.88 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| 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. | Hour | $104.31 | 2 | $208.62 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #4 - Tree/Shrub Removal with Chain Saw

**Scenario Description:**

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns: Degrade plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind. Associated Practices: Conservation Cover (327), Fence (382), Windbreak/shelterbelt Establishment (380), Hedgerow Planting (422).

**Before Situation:**

Plant (trees and/or shrubs) health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material and some are completely dead. Wind now moves freely thru areas that lack any leaves.

**After Situation:**

Integrity and function of windbreak restored. 1,000 feet of windbreak/shelterbelt renovated.

**Feature Measure:** Length of Renovation

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $937.76

**Scenario Cost/Unit:** $0.94

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 8 | $38.64 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 2 | $9.88 |
| 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. | Hour | $17.58 | 8 | $140.64 |
| **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. | Hour | $24.81 | 14 | $347.34 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | $104.31 | 2 | $208.62 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #5 - Removal <8 inches DBH with Skidsteer

**Scenario Description:**

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns include Degraded plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind. Associated Practices: Conservation Cover (327), Fence (382), Windbreak/shelterbelt Establishment (380), Hedgerow Planting (422).

**Before Situation:**

Reduce wind impacts by renovating 1,000 foot windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH < 8 Inches. Typically trees and shrubs are cleared by a Skidsteer using 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.

**After Situation:**

Integrity and function of windbreak restored.

**Feature Measure:** Length of Renovation

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $1,420.38

**Scenario Cost/Unit:** $1.42

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. | Hour | $49.30 | 8 | $394.40 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 10 | $251.80 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #6 - Removal > 8 inches DBH with Dozer

**Scenario Description:**

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns include Degraded plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind. Associated Practices: Conservation Cover (327), Fence (382), Windbreak/shelterbelt Establishment (380), Hedgerow Planting (422).

**Before Situation:**

Reduce wind impacts by renovating 1,000 foot windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH > 8 inches. Typically trees and shrubs are cleared by dozer (D-6 or equivalent) using a brush rake or blade. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped or removed from the treatment area.

**After Situation:**

Integrity and function of windbreak restored.

**Feature Measure:** Length of Renovation

**Scenario Unit::** Foot

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $2,160.68

**Scenario Cost/Unit:** $2.16

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. | Hour | $137.09 | 8 | $1,096.72 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **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 | $539.90 | 1 | $539.90 |

**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:** 350.0

**Scenario Total Cost:** $3,061.80

**Scenario Cost/Unit:** $8.75

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. | Hour | $12.04 | 2 | $24.08 |
| **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. | Hour | $24.81 | 60 | $1,488.60 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Tree, conifer, seedling, containerized, 10 cu. in. | 1519 | Containerized conifer stock, 10 cubic inches (approx 6" plug), 1.7" x 6"). Includes materials and shipping only. | Each | $0.55 | 350 | $192.50 |
| Tree shelter, solid tube type, 5" x 48" | 1571 | 5" x 48" tree tube for protection from animal damage. Materials only. | Each | $2.11 | 350 | $738.50 |
| Stakes, wood, 3/4" x 3/4" x 48" | 1582 | 3/4" x 3/4" x 48" wood stakes to fasten items in place. Includes materials only. | Each | $1.17 | 350 | $409.50 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #8 - Supplemental Plantings, Bare Root

**Scenario Description:**

Parts of the windbreak being renovated have died. Supplemental plantings of bare root 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 bare root 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:** 350.0

**Scenario Total Cost:** $1,184.54

**Scenario Cost/Unit:** $3.38

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. | Hour | $12.04 | 3 | $36.12 |
| **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. | Hour | $24.81 | 30 | $744.30 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Tree, hardwood, seedling or transplant, bare root, 6-18" | 1509 | Bare root hardwood trees 6-18" tall. Includes materials and shipping only. | Each | $0.67 | 200 | $134.00 |
| Tree, conifer, seedling, bare root, 1-1 | 1513 | Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only. | Each | $0.41 | 150 | $61.50 |

**Practice:** 650 - Windbreak/Shelterbelt Renovation

**Scenario** #9 - Coppicing

**Scenario Description:**

Coppicing of selected trees and understory vegetation in a windbreak/shelterbelt is needed to ensure that species composition and stand structure continue to serve their intended purpose. Resource concern is Degraded plant condition- undesirable plant productivity and health. Associated Practices: Conservation Cover (327), Fence (382), Windbreak/shelterbelt Establishment (380), Hedgerow Planting (422).

**Before Situation:**

One acre of windbreak/shelterbelt renovation carried out through manipulating species composition, stand structure, and stocking by the cutting of selected trees and understory vegetation for coppicing and by removing or disposing of slash so as to not interfere with the intended purpose. This manipulation does not include pruning.

**After Situation:**

The integrity and function of the windbreak is restored.

**Feature Measure:** Area of Renovation

**Scenario Unit::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,136.86

**Scenario Cost/Unit:** $1,136.86

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. | Hour | $49.30 | 8 | $394.40 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $2,178.30

**Scenario Cost/Unit:** $1.09

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. | Hour | $73.10 | 8 | $584.80 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 17 | $82.11 |
| **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. | Hour | $24.81 | 17 | $421.77 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 8 | $315.44 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $7,355.54

**Scenario Cost/Unit:** $3.68

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. | Hour | $61.96 | 16 | $991.36 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 16 | $788.80 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 8 | $38.64 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 1 | $12.32 |
| Fertilizer, ground application, dry bulk | 950 | Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $7.31 | 1 | $7.31 |
| Lime application | 953 | Lime application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $11.75 | 1 | $11.75 |
| 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. | Acre | $13.93 | 1 | $13.93 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 10 | $312.60 |
| 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. | Foot | $3.16 | 300 | $948.00 |
| 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. | Hour | $181.68 | 10 | $1,816.80 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 40 | $1,007.20 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **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 | $0.60 | 70 | $42.00 |
| 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 | $0.64 | 55 | $35.20 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Potassium, K2O | 74 | K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed. | Pound | $0.36 | 40 | $14.40 |
| Lime, ENM | 75 | Fertilizer: Limestone Spread on field. | Ton | $93.23 | 1 | $93.23 |
| One Species, Warm Season, Introduced Perennial Grass (seed or sprigs) | 2323 | Introduced, warm season perennial grass seed or sprig. Includes material and shipping only. | Acre | $62.40 | 1 | $62.40 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,717.34

**Scenario Cost/Unit:** $2,717.34

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. | Hour | $73.10 | 12 | $877.20 |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 20 | $96.60 |
| **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. | Hour | $24.81 | 20 | $496.20 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 12 | $473.16 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**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 Foot

**Scenario Typical Size:** 2,000.0

**Scenario Total Cost:** $1,468.83

**Scenario Cost/Unit:** $0.73

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | $332.67 | 0.05 | $16.63 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 37 | $36.26 |
| 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 Yard | $2.77 | 74 | $204.98 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 2 | $20.08 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 1 | $24.61 |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $44.00 | 8 | $352.00 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $1.33 | 325 | $432.25 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 0.0

**Scenario Total Cost:** $4,209.48

**Scenario Cost/Unit:** #Div/0!

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | $332.67 | 0.25 | $83.17 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 200 | $196.00 |
| 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 Yard | $2.77 | 400 | $1,108.00 |
| **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. | Hour | $24.81 | 14 | $347.34 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 2 | $20.08 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 1 | $24.61 |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $44.00 | 8 | $352.00 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $1.33 | 1350 | $1,795.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $12,002.21

**Scenario Cost/Unit:** $12,002.21

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | $332.67 | 1 | $332.67 |
| Stripping and stockpiling, topsoil | 1199 | Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor. | Cubic Yard | $0.98 | 809 | $792.82 |
| 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 Yard | $2.77 | 1619 | $4,484.63 |
| **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. | Hour | $24.81 | 37 | $917.97 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 2 | $20.08 |
| Test, Plant Tissue Test | 301 | Tissue analysis for crops. Includes materials and shipping only. | Each | $24.61 | 1 | $24.61 |
| Test, Standard Water Test, Well Water | 309 | Well Water Suitability test. Includes materials and shipping only. | Each | $44.00 | 8 | $352.00 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $1.33 | 3605 | $4,794.65 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 structure 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::** Foot

**Scenario Typical Size:** 1,250.0

**Scenario Total Cost:** $2,731.40

**Scenario Cost/Unit:** $2.19

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. | Hour | $125.73 | 10 | $1,257.30 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 10 | $394.30 |
| **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 | $539.90 | 2 | $1,079.80 |

**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:** 10.0

**Scenario Total Cost:** $34,261.30

**Scenario Cost/Unit:** $3,426.13

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. | Hour | $181.78 | 150 | $27,267.00 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 150 | $5,914.50 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 structure 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 conversion 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::** Acre

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $8,823.80

**Scenario Cost/Unit:** $588.25

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 Yard | $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 | $539.90 | 2 | $1,079.80 |

**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::** Foot

**Scenario Typical Size:** 250.0

**Scenario Total Cost:** $8,609.50

**Scenario Cost/Unit:** $34.44

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. | Hour | $125.73 | 20 | $2,514.60 |
| Dozer, 105 HP | 1320 | Track mounted Dozer with horsepower range of 90 to 125. Equipment and power unit costs. Labor not included. | Hour | $93.27 | 20 | $1,865.40 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 40 | $1,577.20 |
| 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. | Hour | $49.27 | 10 | $492.70 |
| **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 | $539.90 | 4 | $2,159.60 |

**Practice:** 658 - Wetland Creation

**Scenario** #1 - Wetland Creation

**Scenario Description:**

A wetland is created on a flat mineral upland at a location where surface runoff may be intercepted and ponded by excavation. Resource concerns are 22 - INDEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

**Before Situation:**

The site is in cropland on an upland, non floodplain site (interfluve).

**After Situation:**

An excavation with an average depth of 12" has created a shallow depression in a broad swale which intercepts surface runoff. The excavated material has been spread on adjacent areas. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species.

**Feature Measure:** Acres of Wetland

**Scenario Unit::** Acre

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $21,731.32

**Scenario Cost/Unit:** $4,346.26

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 Yard | $2.56 | 8067 | $20,651.52 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 structure 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::** Acre

**Scenario Typical Size:** 160.0

**Scenario Total Cost:** $57,907.10

**Scenario Cost/Unit:** $361.92

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. | Hour | $69.35 | 24 | $1,664.40 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 80 | $30,092.00 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 40 | $14,478.80 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 40 | $10,784.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 24 | $604.32 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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 structure 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $85,496.95

**Scenario Cost/Unit:** $854.97

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 Yard | $2.56 | 19250 | $49,280.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 50 | $18,807.50 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 25 | $9,049.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 25 | $6,740.50 |
| **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 | $539.90 | 3 | $1,619.70 |

**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 structure 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::** Acre

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $27,350.78

**Scenario Cost/Unit:** $1,823.39

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 Yard | $2.56 | 8067 | $20,651.52 |
| Earthfill, Roller Compacted | 49 | Earthfill, roller or machine compacted, includes equipment and labor | Cubic Yard | $4.83 | 89 | $429.87 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 7.5 | $2,821.13 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 3.75 | $1,357.39 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 3.75 | $1,011.08 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 structure 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 conversion 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::** Acre

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $14,013.39

**Scenario Cost/Unit:** $934.23

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 Yard | $2.56 | 3025 | $7,744.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 7.5 | $2,821.13 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 3.75 | $1,357.39 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 3.75 | $1,011.08 |
| **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 | $539.90 | 2 | $1,079.80 |

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $15,334.69

**Scenario Cost/Unit:** $1,533.47

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. | Hour | $69.35 | 65 | $4,507.75 |
| Truck, dump, 8 CY | 1401 | Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only. | Hour | $63.62 | 40 | $2,544.80 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 5 | $1,880.75 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 2.5 | $904.93 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 2.5 | $674.05 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 85 | $3,351.55 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 8 | $394.16 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $9,288.90

**Scenario Cost/Unit:** $464.45

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 200 | $966.00 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 20 | $625.20 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 20 | $98.80 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 20 | $166.40 |
| **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. | Hour | $24.81 | 240 | $5,954.40 |
| 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. | Hour | $49.27 | 30 | $1,478.10 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,714.81

**Scenario Cost/Unit:** $235.74

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 96 | $463.68 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 8 | $250.08 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 16 | $79.04 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 8 | $66.56 |
| **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. | Hour | $24.81 | 120 | $2,977.20 |
| 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. | Hour | $49.27 | 15 | $739.05 |
| **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. | Acre | $6.96 | 20 | $139.20 |

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $6,912.76

**Scenario Cost/Unit:** $345.64

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 24 | $115.92 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 20 | $625.20 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 16 | $79.04 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 120 | $998.40 |
| **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. | Hour | $24.81 | 160 | $3,969.60 |
| 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. | Hour | $49.27 | 20 | $985.40 |
| **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. | Acre | $6.96 | 20 | $139.20 |

**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 degradation 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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $356.11

**Scenario Cost/Unit:** $178.06

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 4 | $19.32 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 2 | $62.52 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 2 | $9.88 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 2 | $16.64 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 1 | $49.27 |

**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. Resource concerns are degraded plant condition-undesirable 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:** 800.0

**Scenario Total Cost:** $808.86

**Scenario Cost/Unit:** $1.01

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 10 | $48.30 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 4 | $19.76 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $49.27 | 10 | $492.70 |

## USDA - Natural Resources Conservation Service

**New York**

**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:** 120.0

**Scenario Total Cost:** $981.68

**Scenario Cost/Unit:** $8.18

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 20 | $96.60 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 12 | $59.28 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | $8.32 | 4 | $33.28 |
| **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. | Hour | $24.81 | 24 | $595.44 |
| 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. | Hour | $49.27 | 4 | $197.08 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 666 - Forest Stand Improvement

**Scenario** #1 - Thinning Hand Tools

**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 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,249.26

**Scenario Cost/Unit:** $224.93

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 20 | $96.60 |
| **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. | Hour | $24.81 | 20 | $496.20 |
| 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. | Hour | $104.31 | 12 | $1,251.72 |
| **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. | Acre | $6.96 | 3.5 | $24.36 |
| **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 | $190.19 | 2 | $380.38 |

**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. Undesirable species consist of hardwoods and shrubs that can propagate 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,834.56

**Scenario Cost/Unit:** $383.46

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. | Hour | $71.74 | 20 | $1,434.80 |
| Pruning tools, hand tools | 1318 | Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included. | Hour | $4.94 | 20 | $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. | Hour | $24.81 | 20 | $496.20 |
| 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. | Hour | $104.31 | 12 | $1,251.72 |
| **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. | Acre | $6.96 | 3.5 | $24.36 |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 3.5 | $148.30 |
| **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 | $190.19 | 2 | $380.38 |

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $8,130.28

**Scenario Cost/Unit:** $203.26

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chemical, ground application, wildland | 1313 | Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs. | Acre | $129.26 | 40 | $5,170.40 |
| **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. | Hour | $104.31 | 10 | $1,043.10 |
| **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. | Acre | $37.13 | 40 | $1,485.20 |
| 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 shi | Acre | $1.28 | 40 | $51.20 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #5 - Mechanical, Light Equipment

**Scenario Description:**

The stocking rate of an unhealthy stand with competing vegetation is adjusted to an acceptable level using a brush hog. The competing vegetation is controlled to manage desirable trees and species. A brush hog is used by mowing or shredding strips through the stand, mowing between planted rows, etc. to achieve objectives. Stand health and wildlife habitat is improved and undesirable vegetation is managed. 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 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 small enough that it can be mowed or shredded. The stand may also be overstocked.

**After Situation:**

The stocking rate is adjusted to an acceptable level and the competing vegetation is controlled. The stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the increase of sunlight to the forest floor.

**Feature Measure:** Area Treated

**Scenario Unit::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,031.58

**Scenario Cost/Unit:** $203.16

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 20 | $1,147.60 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 20 | $503.60 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #6 - Mechanical, Heavy Equipment

**Scenario Description:**

The stocking rate of an unhealthy stand with competing vegetation 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,486.61

**Scenario Cost/Unit:** $548.66

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. | Hour | $84.38 | 30 | $2,531.40 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 30 | $755.40 |
| 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. | Hour | $104.31 | 15 | $1,564.65 |
| **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. | Acre | $6.96 | 10 | $69.60 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** 666 - Forest Stand Improvement

**Scenario** #8 - Comprehensive Forest Stand Treatment with 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 both forest health and wildlife habitat. 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 mechanical chopper. The material is then run through a chipper/shredder and spread within the stand. Overstocked trees that are inaccessible by the large equipment are removed manually with 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 implement 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $7,585.53

**Scenario Cost/Unit:** $758.55

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 20 | $96.60 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | $84.38 | 10 | $843.80 |
| 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. | Hour | $71.74 | 20 | $1,434.80 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 16 | $500.16 |
| Brush Chipper, 12" capacity | 1869 | Brush Chipper, 12" capacity, typically 130 HP. Includes chipper and power unit. Does not include labor. | Hour | $60.56 | 10 | $605.60 |
| **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. | Hour | $24.81 | 20 | $496.20 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 20 | $503.60 |
| 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. | Hour | $104.31 | 20 | $2,086.20 |
| **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. | Acre | $6.96 | 3.5 | $24.36 |
| 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. | Acre | $37.13 | 1.3 | $48.27 |
| **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 | $190.19 | 2 | $380.38 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,527.88

**Scenario Cost/Unit:** $552.79

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 40 | $193.20 |
| 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. | Hour | $71.74 | 20 | $1,434.80 |
| **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. | Hour | $24.81 | 40 | $992.40 |
| 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. | Hour | $104.31 | 20 | $2,086.20 |
| **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. | Acre | $6.96 | 10 | $69.60 |
| 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. | Acre | $37.13 | 10 | $371.30 |
| **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 | $190.19 | 2 | $380.38 |

**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::** Acre

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $6,893.35

**Scenario Cost/Unit:** $1,378.67

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Feller buncher | 941 | Equipment and power unit costs. Labor not included. | Hour | $129.72 | 30 | $3,891.60 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 30 | $1,182.90 |
| 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. | Hour | $49.27 | 15 | $739.05 |
| **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 | $539.90 | 2 | $1,079.80 |

**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 undesirable species can propagate 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $4,336.40

**Scenario Cost/Unit:** $433.64

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. | Hour | $71.74 | 40 | $2,869.60 |
| **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. | Hour | $104.31 | 10 | $1,043.10 |
| **Materials** | | | | | | |
| Herbicide, Triclopyor | 338 | Refer to WIN-PST for product names and active ingredients. Materials and shipping | Acre | $42.37 | 10 | $423.70 |

**Practice:** 666 - Forest Stand Improvement

**Scenario** #40 - Thinning with Hand Tools without a Consultant

**Scenario Description:**

The stocking rate of an unhealthy stand which lacks species diversity is adjusted to an acceptable stocking level. The operation is supervised by a professional state or local forester and is carried out using hand tools such as chain saws.

**Before Situation:**

The stocking rate 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $889.20

**Scenario Cost/Unit:** $88.92

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 30 | $144.90 |
| **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. | Hour | $24.81 | 30 | $744.30 |

**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.

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $341.43

**Scenario Cost/Unit:** $341.43

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 8 | $38.64 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $104.31 | 1 | $104.31 |

**Practice:** 670 - Lighting System Improvement

**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, three lamp fixtures on a single electronic ballast such as T-8 or T-5 or LED equivalent 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 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 Foot

**Scenario Typical Size:** 50,000.0

**Scenario Total Cost:** $55,921.40

**Scenario Cost/Unit:** $1.12

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. | Hour | $44.32 | 107 | $4,742.24 |
| **Materials** | | | | | | |
| Lighting, fixture, Fluorescent, 75 watt | 1168 | 75 watt fluorescent lamp fixture with T5 or T8 lamps and ballast. Materials only. | Each | $326.53 | 60 | $19,591.80 |
| Lighting, Fixture, High Bay, LED, 150-200 watt | 2602 | 150-200 watt light emitting diode (LED), typically 5000 Kelvin bulb, 11,000-24,000 lumens; industrial grade with fixture; typically replaces up to 400 watt equivalent metal halide; suitably protected from dirt accumulation. Includes materials only. | Each | $644.64 | 49 | $31,587.36 |

**Practice:** 672 - Building Envelope Improvement

**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 cellulose 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 Foot

**Scenario Typical Size:** 25,000.0

**Scenario Total Cost:** $8,209.12

**Scenario Cost/Unit:** $0.33

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. | Hour | $44.32 | 16 | $709.12 |
| **Materials** | | | | | | |
| Insulation, Greenhouse, Reflective Bubble | 2410 | Double bubble reflective insulation with aluminum foil on both sides. Includes materials and shipping only. | Square Foot | $0.30 | 25000 | $7,500.00 |

## USDA - Natural Resources Conservation Service

**New York**

**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::** Acre

**Scenario Typical Size:** 3.0

**Scenario Total Cost:** $2,697.05

**Scenario Cost/Unit:** $899.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| 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. | Hour | $12.04 | 10 | $120.40 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 shi | Acre | $1.28 | 1 | $1.28 |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 341 | $194.37 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 340 | $207.40 |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000BFF2 - Buffer Bundle#2

**Scenario** #1 - Buffer Bundle#2

**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::** Acre

**Scenario Typical Size:** 3.0

**Scenario Total Cost:** $2,697.05

**Scenario Cost/Unit:** $899.02

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Tillage, Light | 945 | Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| 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. | Hour | $12.04 | 10 | $120.40 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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 shi | Acre | $1.28 | 1 | $1.28 |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 341 | $194.37 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 340 | $207.40 |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000CPL1 - Crop Bundle#1 - Precision Ag, No till

**Scenario** #1 - Crop Bundle#1 - Precision Ag, No till

**Scenario Description:**
Addresses water quality degradation, air quality, and fish/wildlife inadequate habitat plus an option on soil erosion or soil quality degradation

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,842.41

**Scenario Cost/Unit:** $38.42

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. | Acre | $10.89 | 100 | $1,089.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acre | $11.79 | 100 | $1,179.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.51 | $191.84 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.45 | $162.89 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.29 | $78.19 |
| **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. | Hour | $49.27 | 1 | $49.27 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| **Materials** | | | | | | |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 25 | $257.75 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000CPL2 - Crop Bundle#2 - Precision Ag, Reduced till

**Scenario** #1 - Crop Bundle#2 - Precision Ag, RT

**Scenario Description:**
Addresses water quality degradation, air quality, and fish/wildlife inadequate habitat plus an option on soil erosion or soil quality degradation

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,842.41

**Scenario Cost/Unit:** $38.42

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. | Acre | $10.89 | 100 | $1,089.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acre | $11.79 | 100 | $1,179.00 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.51 | $191.84 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.45 | $162.89 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.29 | $78.19 |
| **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. | Hour | $49.27 | 1 | $49.27 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| **Materials** | | | | | | |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 25 | $257.75 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000CPL3 - Crop Bundle#3 - Soil health rotation, No till

**Scenario** #1 - Crop Bundle#3 - Soil health rotation, NT

**Scenario Description:**
Addresses soil quality degradation, insufficient water, water quality degradation, 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,224.83

**Scenario Cost/Unit:** $42.25

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. | Acre | $10.89 | 100 | $1,089.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acre | $11.79 | 100 | $1,179.00 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $104.31 | 13 | $1,356.03 |
| **Materials** | | | | | | |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 25 | $257.75 |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000CPL4 - Crop Bundle#4 - Soil health rotation, Reduced till

**Scenario** #1 - Crop Bundle#4 - SH rotation, RT

**Scenario Description:**
Addresses soil quality degradation, insufficient water, water quality degradation, 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,224.83

**Scenario Cost/Unit:** $42.25

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. | Acre | $10.89 | 100 | $1,089.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acre | $11.79 | 100 | $1,179.00 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $104.31 | 13 | $1,356.03 |
| **Materials** | | | | | | |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 25 | $257.75 |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000CPL5 - Crop Bundle#5 - Soil Health Assessment, No till

**Scenario** #1 - Crop Bundle#5 - SH Assessment, NT

**Scenario Description:**
Addresses soil quality degradation, insufficient water, water quality degradation, 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,688.36

**Scenario Cost/Unit:** $46.88

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. | Acre | $10.89 | 100 | $1,089.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acre | $11.79 | 100 | $1,179.00 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $104.31 | 16 | $1,668.96 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 15 | $150.60 |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 25 | $257.75 |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000CPL6 - Crop Bundle#6 - Soil Health Assessment, Reduced till

**Scenario** #1 - Crop Bundle#6 - SH Assessment, RT

**Scenario Description:**
Addresses soil quality degradation, insufficient water, water quality degradation, 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $4,688.36

**Scenario Cost/Unit:** $46.88

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. | Acre | $10.89 | 100 | $1,089.00 |
| Fertilizer, precision application | 952 | Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs. | Acre | $11.79 | 100 | $1,179.00 |
| **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. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $104.31 | 16 | $1,668.96 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 15 | $150.60 |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 25 | $257.75 |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |

## USDA - Natural Resources Conservation Service

**New York**

**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 resource 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::** Acre

**Scenario Typical Size:** 111.0

**Scenario Total Cost:** $9,212.57

**Scenario Cost/Unit:** $83.00

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 45 | $217.35 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 15 | $361.20 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| 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. | Hour | $71.74 | 41 | $2,941.34 |
| 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. | Hour | $12.04 | 11 | $132.44 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 7 | $310.24 |
| 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. | Hour | $24.81 | 49 | $1,215.69 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | $104.31 | 12 | $1,251.72 |
| 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 t | Hour | $71.89 | 17 | $1,222.13 |
| **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. | Acre | $6.96 | 20 | $139.20 |
| 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. | Acre | $17.48 | 1 | $17.48 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acre | $16.93 | 21 | $355.53 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 605 | $344.85 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 218 | $132.98 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000PST1 - Pasture Bundle#1 - Organic

**Scenario** #1 - Pasture Bundle#1 - Organic

**Scenario Description:**
Addresses water quality degradation, 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::** Acre

**Scenario Typical Size:** 111.0

**Scenario Total Cost:** $9,867.15

**Scenario Cost/Unit:** $88.89

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. | Hour | $8.08 | 5 | $40.40 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 5 | $120.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 5 | $136.90 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 30 | $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. | Hour | $24.81 | 33 | $818.73 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 5 | $125.90 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | $104.31 | 4 | $417.24 |
| 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. | Hour | $104.31 | 1 | $104.31 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $71.19 | 4 | $284.76 |
| Post, Wood, CCA treated, 3-4" x 7' | 9 | Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only. | Each | $6.26 | 20 | $125.20 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 8 | $120.80 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $6.68 | 90 | $601.20 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Foot | $0.17 | 1320 | $224.40 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 2 | $332.58 |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 10 | $5,714.60 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000PST2 - Pasture Bundle#2

**Scenario** #1 - Pasture Bundle#2

**Scenario Description:**
Addresses soil quality degradation, water quality degradation, and degraded plant condition plus an option on 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::** Acre

**Scenario Typical Size:** 210.0

**Scenario Total Cost:** $3,626.66

**Scenario Cost/Unit:** $17.27

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| 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. | Hour | $71.74 | 2 | $143.48 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 6 | $187.56 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 0 | $0.00 |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 10 | $166.50 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 1 | $47.61 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| 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 | $0.50 | 2000 | $1,000.00 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 3 | $30.12 |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 20 | $966.80 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000PST3 - Pasture Bundle#3 -- Soil Health

**Scenario** #1 - Pasture Bundle#3 -- Soil Health

**Scenario Description:**
Addresses soil quality degradation, water quality degradation, and degraded plant condition

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,357.91

**Scenario Cost/Unit:** $33.58

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 | $63.92 | 1 | $63.92 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 0 | $0.00 |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 25 | $416.25 |
| **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. | Hour | $44.32 | 32 | $1,418.24 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 20 | $966.80 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** B000PST4 - Pasture Bundle#4 - Monarch butterfly

**Scenario** #1 - Pasture Bundle#4 - Monarch butterfly

**Scenario Description:**
Addresses soil erosion, soil quality degradation, 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::** Acre

**Scenario Typical Size:** 200.0

**Scenario Total Cost:** $9,367.21

**Scenario Cost/Unit:** $46.84

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 | $63.92 | 1 | $63.92 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 0 | $0.00 |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 25 | $416.25 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 1 | $47.61 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 10 | $2,151.60 |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 10 | $5,714.60 |

**Practice:** E315132Z - Herbaceous weed control for desired plant communities/habitats consistent with the ecological site

**Scenario** #1 - Herbaceous weed control-habitats

**Scenario Description:**

Mechanical, chemical, or biological, herbaceous weed control 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $143.48

**Scenario Cost/Unit:** $14.35

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. | Hour | $71.74 | 2 | $143.48 |

**Practice:** E315133Z - Herbaceous weed control (inadequate structure and comp) for desired plant communities/habitats

**Scenario** #1 - Herbaceous weed control-communities

**Scenario Description:**

Mechanical, chemical, or biological, herbaceous weed control 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $143.48

**Scenario Cost/Unit:** $14.35

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. | Hour | $71.74 | 2 | $143.48 |

**Practice:** E315134Z - Herbaceous weed control (plant pest pressures) for desired plant communities/habitats

**Scenario** #1 - Herbaceous weed control-pest pressures

**Scenario Description:**

Mechanical, chemical, or biological, herbaceous weed control 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $143.48

**Scenario Cost/Unit:** $14.35

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. | Hour | $71.74 | 2 | $143.48 |

**Practice:** E327136Z1 - Conservation cover to provide food habitat for pollinators and beneficial insects

**Scenario** #1 - Conservation cover-pollinator food

**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

**Scenario Unit::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $343.05

**Scenario Cost/Unit:** $343.05

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. | Hour | $44.32 | 2 | $88.64 |
| **Materials** | | | | | | |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E327136Z2 - Establish Monarch butterfly habitat

**Scenario** #1 - Establish monarch butterfly habitat

**Scenario Description:**

Seed or plug milkweed (Asclepias spp.), the Monarch butterfly larval hostplant, and high-value monarch butterfly nectar plants in non-cropped areas such as field borders, contour buffer strips, and associated grasslands.

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $2,411.58

**Scenario Cost/Unit:** $2,411.58

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 1 | $57.38 |
| 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. | Hour | $71.74 | 2 | $143.48 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **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. | Hour | $49.27 | 2 | $98.54 |
| 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. | Hour | $104.31 | 1 | $104.31 |
| **Materials** | | | | | | |
| Highly Specialized native grass and forb mix | 2618 | A mix of native grass and forbs to be used for restoration of Monarch butterfly foraging and larva development habitat. Includes material and shipping only. | Acre | $1,999.36 | 1 | $1,999.36 |

**Practice:** E327137Z - Conservation cover to provide cover and shelter habitat for pollinators and beneficial insects

**Scenario** #1 - Conservation cover-pollinator shelter

**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

**Scenario Unit::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $343.05

**Scenario Cost/Unit:** $343.05

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. | Hour | $44.32 | 2 | $88.64 |
| **Materials** | | | | | | |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |

**Practice:** E327139Z - Conservation cover to provide habitat continuity for pollinators and beneficial insects

**Scenario** #1 - Conservation cover-habitat continuity

**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

**Scenario Unit::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $343.05

**Scenario Cost/Unit:** $343.05

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. | Hour | $44.32 | 2 | $88.64 |
| **Materials** | | | | | | |
| Untreated Conventional Seed, Pollinator Mix, Native Perennial Grasses and Forbs | 2346 | Untreated conventional native perennial grass and legume pollinator mix. May contain seed that are not available as certified organic. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |

**Practice:** E328101I - Improved resource conserving crop rotation to reduce water erosion

**Scenario** #1 - IRCCR water erosion

**Scenario Description:**

Improve an existing Resource Conserving Crop Rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $521.55

**Scenario Cost/Unit:** $5.22

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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** E328101R - Resource conserving crop rotation to reduce water erosion

**Scenario** #1 - RCCR water erosion

**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 plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,460.34

**Scenario Cost/Unit:** $14.60

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. | Hour | $104.31 | 14 | $1,460.34 |

**Practice:** E328101Z - Conservation crop rotation on recently converted CRP grass/legume cover for water erosion

**Scenario** #1 - CRP trans crop rotation-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 than10 and reduces soil erosion from water to below soil tolerance (T) level. RUSLE2 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E328102I - Improved resource conserving crop rotation to reduce wind erosion

**Scenario** #1 - IRCCR wind erosion

**Scenario Description:**

Improve an existing Resource Conserving Crop Rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $521.55

**Scenario Cost/Unit:** $5.22

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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** E328102R - Resource conserving crop rotation to reduce wind erosion

**Scenario** #1 - RCCR wind erosion

**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 plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,460.34

**Scenario Cost/Unit:** $14.60

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. | Hour | $104.31 | 14 | $1,460.34 |

**Practice:** E328102Z - Conservation crop rotation on recently converted CRP grass/legume cover for wind erosion

**Scenario** #1 - CRP trans crop rotation-wind 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 than10 and reduces soil erosion from wind to below soil tolerance (T) level. WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E328106I - Improved resource conserving crop rotation for soil organic matter improvement

**Scenario** #1 - IRCCR for SOM improvement

**Scenario Description:**

Improve an existing Resource Conserving Crop Rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $521.55

**Scenario Cost/Unit:** $5.22

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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** E328106R - Resource conserving crop rotation for soil organic matter improvement

**Scenario** #1 - RCCR for SOM improvement

**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 plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,460.34

**Scenario Cost/Unit:** $14.60

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. | Hour | $104.31 | 14 | $1,460.34 |

**Practice:** E328106Z1 - 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) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $521.55

**Scenario Cost/Unit:** $5.22

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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** E328106Z2 - Modifications to improve soil health and increase soil organic matter

**Scenario** #1 - Mod to improve SH and SOM

**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) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $985.08

**Scenario Cost/Unit:** $9.85

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. | Hour | $104.31 | 8 | $834.48 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 15 | $150.60 |

**Practice:** E328106Z3 - Conservation crop rotation on recently converted CRP grass/legume cover for SOM improvement

**Scenario** #1 - CRP trans crop rotation-SOM

**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. The crop rotation adds diversity to the system; keeps a living root growing; and is managed to minimize soil chemical, physical and biological disturbance and maintain residue cover on the surface. The rotation includes crops and/or cover crops representing 3 of the 4 crop types during the planned crop sequence: warm season grass (WSG), warm season broadleaf (WSB), cool season grass (CSG), or cool season broadleaf (CSB). The crop rotation will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the SCI. Crop rotation minimizes disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than10 and reduces soil erosion from wind to below soil tolerance (T) level. RUSLE2 or WEPS must be used to document the rotation, STIR and SCI 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $521.55

**Scenario Cost/Unit:** $5.22

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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** E328107I - Improved resource conserving crop rotation to improve soil compaction

**Scenario** #1 - IRCCR to improve soil compaction

**Scenario Description:**

Improve an existing Resource Conserving Crop Rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $521.55

**Scenario Cost/Unit:** $5.22

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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** E328107R - Resource conserving crop rotation to improve soil compaction

**Scenario** #1 - RCCR to improve soil compaction

**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 plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,460.34

**Scenario Cost/Unit:** $14.60

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. | Hour | $104.31 | 14 | $1,460.34 |

**Practice:** E328134I - Improved resource conserving crop rotation to relieve plant pest pressure

**Scenario** #1 - IRCCR to relieve plant pest pressure

**Scenario Description:**

Improve an existing Resource Conserving Crop Rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $521.55

**Scenario Cost/Unit:** $5.22

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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** E328134R - Resource conserving crop rotation to relieve plant pest pressure

**Scenario** #1 - RCCR to relieve plant pest pressure

**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 plan 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,460.34

**Scenario Cost/Unit:** $14.60

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. | Hour | $104.31 | 14 | $1,460.34 |

**Practice:** E328136Z - Leave standing grain crops unharvested to benefit wildlife food sources

**Scenario** #1 - Leave standing grain crops for food

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $482.18

**Scenario Cost/Unit:** $4.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.51 | $191.84 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.45 | $162.89 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.29 | $78.19 |
| **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. | Hour | $49.27 | 1 | $49.27 |

**Practice:** E328137Z - Leave standing grain crops unharvested to benefit wildlife cover and shelter

**Scenario** #1 - Leave standing grain crops for shelter

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $482.18

**Scenario Cost/Unit:** $4.82

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.51 | $191.84 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.45 | $162.89 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.29 | $78.19 |
| **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. | Hour | $49.27 | 1 | $49.27 |

**Practice:** E329101Z - No till to reduce water erosion

**Scenario** #1 - No till to reduce water 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 erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. RUSLE2 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E329102Z - No till system to reduce wind erosion

**Scenario** #1 - No till system to reduce wind erosion

**Scenario Description:**

Establish no till system to reduce wind erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for 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. WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E329106Z - No till system to increase soil health and soil organic matter content

**Scenario** #1 - No till system to increase SH and SOM

**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 20. 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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $417.24

**Scenario Cost/Unit:** $4.17

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. | Hour | $104.31 | 4 | $417.24 |

**Practice:** E329114Z - No till to increase plant-available moisture: irrigation water

**Scenario** #1 - No till for IWM

**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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E329115Z - No till to increase plant-available moisture: moisture management

**Scenario** #1 - No till for moisture mgmt

**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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E329128Z - No till to reduce tillage induced particulate matter

**Scenario** #1 - No till to reduce PM

**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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E329144Z - 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $417.24

**Scenario Cost/Unit:** $4.17

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. | Hour | $104.31 | 4 | $417.24 |

**Practice:** E334107Z - Controlled traffic farming to reduce compaction

**Scenario** #1 - Controlled traffic for 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $769.65

**Scenario Cost/Unit:** $7.70

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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $104.31 | 5 | $521.55 |

**Practice:** E340101Z - Cover crop to reduce water erosion

**Scenario** #1 - Cover crop to reduce water erosion

**Scenario Description:**

Cover crop added to current crop rotation to reduce soil erosion from water 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $809.52

**Scenario Cost/Unit:** $8.10

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. | Hour | $44.32 | 1 | $44.32 |
| **Materials** | | | | | | |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 20 | $765.20 |

**Practice:** E340102Z - Cover crop to reduce wind erosion

**Scenario** #1 - Cover crop to reduce wind erosion

**Scenario Description:**

Cover crop added to current crop rotation to reduce soil erosion from wind to below the 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $809.52

**Scenario Cost/Unit:** $8.10

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. | Hour | $44.32 | 1 | $44.32 |
| **Materials** | | | | | | |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 20 | $765.20 |

**Practice:** E340106Z1 - Intensive cover cropping to increase soil health and soil organic matter content

**Scenario** #1 - Cover cropping for SH and SOM

**Scenario Description:**

Use of cover crops in a cropping system to add diversity, keep the soil covered, and maintain a living root as long as possible. Cover crop will be used during ALL non-crop production periods in an annual crop rotation. Cover crop may be a single species or multi-species mix. 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 and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. RUSLE2 or WEPS must be used to document SCI calculations. Cover crops may be grazed following a prescribed grazing plan that removes no more than 40% of the biomass produced.

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,262.22

**Scenario Cost/Unit:** $12.62

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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 20 | $1,053.60 |

**Practice:** E340106Z2 - Use of multi-species cover crops to improve soil health and increase soil organic matter

**Scenario** #1 - Multi-species cover crops

**Scenario Description:**

Implement a multi-species cover crop to add diversity and increase biomass production to improve soil health and increased 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,258.64

**Scenario Cost/Unit:** $12.59

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. | Hour | $44.32 | 2 | $88.64 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 20 | $1,170.00 |

**Practice:** E340106Z3 - Intensive cover cropping (orchard/vineyard floor) to increase soil health and SOM content

**Scenario** #1 - Cover cropping for orchards/vineyards

**Scenario Description:**

Implementation of cover crops to provide orchard or vineyard floor coverage throughout the year. Cover crop shall not be harvested, grazed, or burned. Planned cover crop management activities 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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,142.24

**Scenario Cost/Unit:** $11.42

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. | Hour | $44.32 | 2 | $88.64 |
| **Materials** | | | | | | |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 20 | $1,053.60 |

**Practice:** E340106Z4 - Use of SHA to assist with development of cover crop mix to improve soil health and increase SOM

**Scenario** #1 - Soil health assessment

**Scenario Description:**

Use of a soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Soil health assessment results will be utilized to determine the correct Carbon to Nitrogen ratio of a multi-species cover crop mix that will be added to the crop rotation. During Year 3 a follow up assessment will be completed to allow time for the addition of a cover crop to increased soil organic matter.

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,489.83

**Scenario Cost/Unit:** $14.90

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. | Hour | $44.32 | 1 | $44.32 |
| 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. | Hour | $104.31 | 1 | $104.31 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 15 | $150.60 |
| Three Species Mix, Warm Season, Annual Grasses and Legumes | 2326 | Warm season annual grass and legume mix. Includes material and shipping only. | Acre | $59.53 | 20 | $1,190.60 |

**Practice:** E340107Z - 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,097.92

**Scenario Cost/Unit:** $10.98

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. | Hour | $44.32 | 1 | $44.32 |
| **Materials** | | | | | | |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 20 | $1,053.60 |

**Practice:** E340118Z - Cover crop to reduce water quality degradation by utilizing excess soil nutrients-surface water

**Scenario** #1 - Cover crop for WQ nutrients-runoff

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,097.92

**Scenario Cost/Unit:** $10.98

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. | Hour | $44.32 | 1 | $44.32 |
| **Materials** | | | | | | |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 20 | $1,053.60 |

**Practice:** E340119Z - Cover crop to reduce water quality degradation by utilizing excess soil nutrients-ground water

**Scenario** #1 - Cover crops for WQ nutrients-drainage

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,097.92

**Scenario Cost/Unit:** $10.98

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. | Hour | $44.32 | 1 | $44.32 |
| **Materials** | | | | | | |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 20 | $1,053.60 |

**Practice:** E340134Z - Cover crop to suppress excessive weed pressures and break pest cycles

**Scenario** #1 - Cover crops for suppression

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,142.24

**Scenario Cost/Unit:** $11.42

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. | Hour | $44.32 | 2 | $88.64 |
| **Materials** | | | | | | |
| Two Species Mix, Cool Season Annual (1 grass and 1 legume) | 2314 | Cool season annual grass and legume mix. Includes material and shipping only. | Acre | $52.68 | 20 | $1,053.60 |

**Practice:** E345101Z - Reduced tillage to reduce water erosion

**Scenario** #1 - Reduced tillage to reduce water erosion

**Scenario Description:**

Establish a reduced tillage 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 erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. RUSLE2 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $417.24

**Scenario Cost/Unit:** $4.17

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. | Hour | $104.31 | 4 | $417.24 |

**Practice:** E345102Z - Reduced tillage to reduce wind erosion

**Scenario** #1 - Reduced tillage to reduce wind erosion

**Scenario Description:**

Establish a reduced tillage system to reduce wind erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for 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. WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E345106Z - Reduced tillage to increase soil health and soil organic matter content

**Scenario** #1 - Reduced tillage for SH and SOM

**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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $417.24

**Scenario Cost/Unit:** $4.17

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. | Hour | $104.31 | 4 | $417.24 |

**Practice:** E345114Z - Reduced tillage to increase plant-available moisture: irrigation water

**Scenario** #1 - Reduced tillage for IWM

**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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E345115Z - Reduced tillage to increase plant-available moisture: moisture management

**Scenario** #1 - Reduced tillage for moisture mgmt

**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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E345128Z - Reduced tillage to reduce tillage induced particulate matter

**Scenario** #1 - Reduced tillage to reduce PM

**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. RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $312.93

**Scenario Cost/Unit:** $3.13

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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E345144Z - 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. RUSLE2 must be used to document STIR calculations and energy consumption. <State lists will be prepared providing conventional system benchmark energy values and reduced tillage system values for those systems using at least 25% less energy>

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $417.24

**Scenario Cost/Unit:** $4.17

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. | Hour | $104.31 | 4 | $417.24 |

**Practice:** E374144Z1 - Install variable frequency drive(s) on pump(s)

**Scenario** #1 - Variable frequency drives

**Scenario Description:**

Install Variable Frequency Drive(s) (CPS 533 Pumping Plant) with the correct sensors, on all pumps indicated in the energy audit.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

**Feature Measure:** Each

**Scenario Unit::** Brake Horse Power

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $12,179.50

**Scenario Cost/Unit:** $243.59

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 | $243.59 | 50 | $12,179.50 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E374144Z2 - Switch fuel source for pump motor(s)

**Scenario** #1 - Switch fuel source for pump motor(s)

**Scenario Description:**

Switch fuel source for the pump motor(s) indicated in the audit to a renewable source (wind, solar, geothermal, etc..). (CPS 533 Pumping Plant)

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 374 - Farmstead Energy Improvement

**Feature Measure:** Horsepower

**Scenario Unit::** Horsepower

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $38,720.67

**Scenario Cost/Unit:** $7,744.13

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| **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. | Hour | $44.32 | 12 | $531.84 |
| 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. | Hour | $104.31 | 2 | $208.62 |
| **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 a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will | Each | $549.88 | 1 | $549.88 |
| 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. The completed pump and moto | Horsepower | $413.86 | 5 | $2,069.30 |
| 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 incl | Each | $460.51 | 5 | $2,302.55 |
| 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 any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all ma | Kilowatt | $8,258.60 | 4 | $33,034.40 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E386101Z - Enhanced field borders to reduce water induced erosion along the edge(s) of a field

**Scenario** #1 - Field borders to reduce water erosion

**Scenario Description:**

Enhance existing field borders to a width of at least 30 feet and establish a single specie 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $739.04

**Scenario Cost/Unit:** $739.04

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E386102Z - Enhanced field borders to reduce wind induced erosion along the windward side(s) of a field

**Scenario** #1 - Field borders to reduce wind erosion

**Scenario Description:**

Enhance existing field borders to a width of at least 30 feet and establish a single specie 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $739.04

**Scenario Cost/Unit:** $739.04

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E386106Z - Enhanced field borders to increase carbon storage along the edge(s) of the field

**Scenario** #1 - Field borders to increase carbon storage

**Scenario Description:**

Enhance existing field borders to a width of at least 30 feet and establish a single specie 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $739.04

**Scenario Cost/Unit:** $739.04

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** E386128Z - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

**Scenario** #1 - Field borders to decrease particulates

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $739.04

**Scenario Cost/Unit:** $739.04

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** E386136Z - Enhanced field border to provide wildlife food for pollinators along the edge(s) of a field

**Scenario** #1 - Field border to provide wildlife food

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $739.04

**Scenario Cost/Unit:** $739.04

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** E386137Z - Enhanced field border to provide wildlife cover or shelter along the edge(s) of a field

**Scenario** #1 - Field border to provide wildlife cover

**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 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $739.04

**Scenario Cost/Unit:** $739.04

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** E386139Z - Enhanced field border to provide wildlife habitat continuity along the edge(s) of a field

**Scenario** #1 - Field border to provide continuity

**Scenario Description:**
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide wildlife habitat continuity 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $739.04

**Scenario Cost/Unit:** $739.04

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** E390118Z - Increase riparian herbaceous cover width for nutrient reduction

**Scenario** #1 - Riparian herbaceous cover-nut 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 nutrient removal from surface and subsurface flows. Saturated buffer or nutrient control wetland to capture subsurface drainage.

**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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $1,142.23

**Scenario Cost/Unit:** $571.11

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. | Acre | $6.78 | 2 | $13.56 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 2 | $47.22 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.82 | $308.44 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.72 | $260.62 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.46 | $124.03 |
| **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. | Acre | $37.13 | 2 | $74.26 |
| One Species, Cool Season, Native Perennial Grass | 2312 | Native, cool season perennial grass. Includes material and shipping only. | Acre | $157.05 | 2 | $314.10 |

**Practice:** E390126Z - Increase riparian herbaceous cover width to reduce sediment loading

**Scenario** #1 - Riparian herbaceous cover-sed loading

**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 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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $1,142.23

**Scenario Cost/Unit:** $571.11

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. | Acre | $6.78 | 2 | $13.56 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 2 | $47.22 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.82 | $308.44 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.72 | $260.62 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.46 | $124.03 |
| **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. | Acre | $37.13 | 2 | $74.26 |
| One Species, Cool Season, Native Perennial Grass | 2312 | Native, cool season perennial grass. Includes material and shipping only. | Acre | $157.05 | 2 | $314.10 |

**Practice:** E390136Z - Increase riparian herbaceous cover width to enhance wildlife habitat

**Scenario** #1 - Riparian herbaceous cover-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::** Acre

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $3,082.43

**Scenario Cost/Unit:** $770.61

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. | Acre | $6.78 | 4 | $27.12 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 2 | $47.22 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 1 | $376.15 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 1 | $361.97 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.46 | $124.03 |
| **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. | Acre | $37.13 | 4 | $148.52 |
| Specialized native grass and forb mix | 2619 | A mix of native grass and forbs to be used for specialized purposes such as wildlife (including pollinators) or ecosystem restoration, requiring species not readility available and/or difficult to produce and harvest. Includes material and shipping only | Acre | $998.71 | 2 | $1,997.42 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E391118Z - Increase riparian forest buffer width for nutrient reduction

**Scenario** #1 - Riparian forest buffer-nut 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 nutrient removal from surface and subsurface flows. Saturated buffer or nutrient control wetland to capture subsurface drainage.

**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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $3,637.73

**Scenario Cost/Unit:** $1,818.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 2 | $114.76 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 4 | $109.52 |
| 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. | Hour | $12.04 | 16 | $192.64 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.82 | $308.44 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.72 | $260.62 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.46 | $124.03 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 872 | $531.92 |
| Tree shelter, solid tube type, 4" x 48" | 1566 | 4" x 48" tree tube for protection from animal damage. Materials only. | Each | $4.14 | 100 | $414.00 |
| Stakes, wood, 1" x 1" x 48" | 1578 | 1" x 1" x 48" wood stakes to fasten items in place. Includes materials only. | Each | $2.04 | 100 | $204.00 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** E391126Z - Increase riparian forest buffer width to reduce sediment loading

**Scenario** #1 - Riparian forest buffer-sed loading

**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 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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $3,637.73

**Scenario Cost/Unit:** $1,818.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 2 | $114.76 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 4 | $109.52 |
| 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. | Hour | $12.04 | 16 | $192.64 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.82 | $308.44 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.72 | $260.62 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.46 | $124.03 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 872 | $531.92 |
| Tree shelter, solid tube type, 4" x 48" | 1566 | 4" x 48" tree tube for protection from animal damage. Materials only. | Each | $4.14 | 100 | $414.00 |
| Stakes, wood, 1" x 1" x 48" | 1578 | 1" x 1" x 48" wood stakes to fasten items in place. Includes materials only. | Each | $2.04 | 100 | $204.00 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E391127Z - Increase stream shading for stream temperature reduction

**Scenario** #1 - Shade stream to reduce temp

**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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $3,637.73

**Scenario Cost/Unit:** $1,818.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 2 | $114.76 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 4 | $109.52 |
| 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. | Hour | $12.04 | 16 | $192.64 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.82 | $308.44 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.72 | $260.62 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.46 | $124.03 |
| **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. | Hour | $24.81 | 2 | $49.62 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 872 | $531.92 |
| Tree shelter, solid tube type, 4" x 48" | 1566 | 4" x 48" tree tube for protection from animal damage. Materials only. | Each | $4.14 | 100 | $414.00 |
| Stakes, wood, 1" x 1" x 48" | 1578 | 1" x 1" x 48" wood stakes to fasten items in place. Includes materials only. | Each | $2.04 | 100 | $204.00 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** E391136Z - Increase riparian forest buffer width to enhance wildlife habitat

**Scenario** #1 - Riparian forest buffer-habitat

**Scenario Description:**

Where an existing forested riparian area 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) 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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $3,637.73

**Scenario Cost/Unit:** $1,818.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 16 | $385.28 |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 2 | $114.76 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 4 | $109.52 |
| 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. | Hour | $12.04 | 16 | $192.64 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.82 | $308.44 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.72 | $260.62 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.46 | $124.03 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $24.81 | 2 | $49.62 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 872 | $531.92 |
| Tree shelter, solid tube type, 4" x 48" | 1566 | 4" x 48" tree tube for protection from animal damage. Materials only. | Each | $4.14 | 100 | $414.00 |
| Stakes, wood, 1" x 1" x 48" | 1578 | 1" x 1" x 48" wood stakes to fasten items in place. Includes materials only. | Each | $2.04 | 100 | $204.00 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** E393118Z - Extend existing filter strip to reduce excess nutrients in surface water

**Scenario** #1 - Extend filter strips- nut runoff

**Scenario Description:**

Extend existing filter strips for water quality protection (reduce excess nutrients in surface water). 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $947.66

**Scenario Cost/Unit:** $947.66

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

**Practice:** E393122Z - Extend existing filter strip to reduce excess pathogens and chemicals in surface water

**Scenario** #1 - Extend filter strips-pathogen runoff

**Scenario Description:**

Extend existing filter strips for water quality protection (reduce excess pathogens and chemicals from manure, bio-solids or compost applications in surface waters ). 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $947.66

**Scenario Cost/Unit:** $947.66

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E393126Z - Extend existing filter strip to reduce excess sediment in surface water

**Scenario** #1 - Extend filter strips-sediment

**Scenario Description:**

Extend existing filter strips for water quality protection (reduce excess sediment in surface waters ). 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $947.66

**Scenario Cost/Unit:** $947.66

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. | Acre | $12.32 | 1 | $12.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| Cultipacking | 1100 | Includes equipment, power unit and labor costs. | Acre | $8.51 | 1 | $8.51 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Five Species Mix, Cool Season, Annual Grasses and Legumes | 2320 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $58.50 | 1 | $58.50 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E395137X - Stream habitat improvement through placement of woody biomass

**Scenario** #1 - Stream habitat improvement with wood

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $21,550.50

**Scenario Cost/Unit:** $21,550.50

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. | Hour | $181.78 | 16 | $2,908.48 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 8 | $855.28 |
| **Labor** | | | | | | |
| Equipment Operators, Heavy | 233 | Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12???, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons. | Hour | $39.43 | 24 | $946.32 |
| **Materials** | | | | | | |
| Aggregate, Sand, Graded, Washed | 45 | Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place | Cubic Yard | $30.84 | 20 | $616.80 |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 30 | $937.50 |
| Compost | 265 | A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients. | Ton | $43.27 | 1 | $43.27 |
| Cuttings, woody, large size | 1309 | Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only. | Each | $17.90 | 300 | $5,370.00 |
| Boulder | 1761 | Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only. | Ton | $34.32 | 40 | $1,372.80 |
| Steel, rebar | 1832 | Steel rebar, grade 60. Materials only. | Pound | $0.55 | 50 | $27.50 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 15 | $393.15 |
| Log, un-anchored | 2035 | Price of log picked up at the Mill. Includes material only. | Ton | $227.38 | 30 | $6,821.40 |
| Root Wad | 2045 | Tree stump buried into the streambank with the roots left exposed. Includes material only. | Ton | $8.91 | 20 | $178.20 |
| **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 | $539.90 | 2 | $1,079.80 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E399137X - Fishpond management for native aquatic and terrestrial species

**Scenario** #1 - Fishpond mgmt

**Scenario Description:**

Pond rehabilitation (e.g., dredging), 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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $3,723.42

**Scenario Cost/Unit:** $1,861.71

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 1 | $23.61 |
| **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. | Hour | $44.32 | 3 | $132.96 |
| 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. | Hour | $24.81 | 32 | $793.92 |
| **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. | Acre | $37.13 | 1 | $37.13 |
| 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. | Gallon | $113.80 | 1 | $113.80 |
| Native Aquatic Plants, Emergent or Submerged | 2336 | Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping. | Each | $1.33 | 1000 | $1,330.00 |
| Specialized native grass and forb mix | 2619 | A mix of native grass and forbs to be used for specialized purposes such as wildlife (including pollinators) or ecosystem restoration, requiring species not readility available and/or difficult to produce and harvest. Includes material and shipping only | Acre | $998.71 | 1 | $998.71 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** E449114Z1 - Advanced IWM--Soil moisture is monitored, recorded, and used in decision making

**Scenario** #1 - Advanced IWM-soil moisture

**Scenario Description:**

Advanced irrigation water management using soil moisture monitoring (one sensor per 40 acres or more) with data loggers. Record keeping is such that a daily water balance is calculated, and future irrigations forecast.

**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::** Acre

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $4,775.71

**Scenario Cost/Unit:** $59.70

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. | Hour | $44.32 | 40 | $1,772.80 |
| 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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $104.31 | 6 | $625.86 |
| **Materials** | | | | | | |
| 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 | $449.51 | 1 | $449.51 |
| 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 | $1,679.44 | 1 | $1,679.44 |

**Practice:** E449114Z2 - Advanced IWM--Weather is monitored, recorded and used in decision making

**Scenario** #1 - Advanced IWM-weather

**Scenario Description:**

Advanced irrigation water management using on-site weather measurements to calculate real-time evapotranspiration and forecast future water use by plants. Record keeping is such that a daily water balance is calculated and future irrigations forecast.

**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::** Acre

**Scenario Typical Size:** 80.0

**Scenario Total Cost:** $5,216.31

**Scenario Cost/Unit:** $65.20

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. | Hour | $24.81 | 20 | $496.20 |
| 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. | Hour | $104.31 | 4 | $417.24 |
| **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 incl | Each | $460.51 | 1 | $460.51 |
| 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 | $655.75 | 1 | $655.75 |
| 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 | $1,679.44 | 1 | $1,679.44 |
| Soil Moisture Meter | 1455 | Soil Moisture Sensor Reader. Equipment only. | Each | $285.50 | 1 | $285.50 |
| Soil Moisture Sensor | 1456 | Soil moisture resistance sensor W/10' cables. Equipment only. | Each | $36.74 | 2 | $73.48 |
| 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 | Each | $1,070.10 | 1 | $1,070.10 |
| **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 | $78.09 | 1 | $78.09 |

**Practice:** E449114Z3 - Complete pumping plant eval for all pumps on a farm to determine the VFD potential

**Scenario** #1 - Pumping plant evaluation for VFD

**Scenario Description:**

On branching systems, or pumps that service multiple fields, or multiple pumps, install a Variable Frequency Drive motor controller(s) if recommended in the pump test and the simple payback in terms of energy savings is less than 10 years.

**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::** Acre

**Scenario Typical Size:** 640.0

**Scenario Total Cost:** $3,504.14

**Scenario Cost/Unit:** $5.48

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 prod | Hour | $88.79 | 35 | $3,107.65 |
| 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. | Hour | $31.84 | 10 | $318.40 |
| **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 | $78.09 | 1 | $78.09 |

**Practice:** E449144Z - Complete pumping plant evaluation for all pumps on a farm.

**Scenario** #1 - Pumping plant evaluation

**Scenario Description:**
Rehabilitate/replace/reconfigure all pumps that have the potential to perform 10% more efficiently as identified in the pump test.

**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::** Acre

**Scenario Typical Size:** 640.0

**Scenario Total Cost:** $3,504.14

**Scenario Cost/Unit:** $5.48

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 prod | Hour | $88.79 | 35 | $3,107.65 |
| 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. | Hour | $31.84 | 10 | $318.40 |
| **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 | $78.09 | 1 | $78.09 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E472118Z - Manage livestock access to streams/ditches/other waterbodies to reduce nutrients in surface water

**Scenario** #1 - Livestock access to waterbody-nutrients

**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 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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $3,121.46

**Scenario Cost/Unit:** $2.36

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. | Hour | $8.08 | 5 | $40.40 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 5 | $120.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 5 | $136.90 |
| **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. | Hour | $24.81 | 33 | $818.73 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 5 | $125.90 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $71.19 | 4 | $284.76 |
| Post, Wood, CCA treated, 3-4" x 7' | 9 | Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only. | Each | $6.26 | 20 | $125.20 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 8 | $120.80 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $6.68 | 90 | $601.20 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Foot | $0.17 | 1320 | $224.40 |
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 2 | $332.58 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E472122Z - Manage livestock access to streams/ditches/other waterbodies to reduce pathogens in surface water

**Scenario** #1 - Livestock access to waterbody-pathogens

**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 the introduction of pathogens 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::** Foot

**Scenario Typical Size:** 1,320.0

**Scenario Total Cost:** $3,121.46

**Scenario Cost/Unit:** $2.36

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. | Hour | $8.08 | 5 | $40.40 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 5 | $120.40 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 5 | $136.90 |
| **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. | Hour | $24.81 | 33 | $818.73 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 5 | $125.90 |
| **Materials** | | | | | | |
| Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll | 1 | Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only. | Each | $71.19 | 4 | $284.76 |
| Post, Wood, CCA treated, 3-4" x 7' | 9 | Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only. | Each | $6.26 | 20 | $125.20 |
| Post, Wood, CCA treated, 6" x 8' | 12 | Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only. | Each | $15.10 | 8 | $120.80 |
| Post, Steel T, 1.33 lbs, 6' | 15 | Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only. | Each | $6.68 | 90 | $601.20 |
| Fence, Wire Assembly, Barbed Wire | 30 | Brace pins, battens, clips, staples. Includes materials and shipping only. | Foot | $0.17 | 1320 | $224.40 |
| Gate, Pipe, 12' | 1057 | 6 rail tube gate, 16 gauge. Includes materials and shipping only. | Each | $166.29 | 2 | $332.58 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** E484106Z - 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 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) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). RUSLE2 or WEPS 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $208.62

**Scenario Cost/Unit:** $2.09

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. | Hour | $104.31 | 2 | $208.62 |

**Practice:** E511137Z1 - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

**Scenario** #1 - Harvest using wildlife friendly methods

**Scenario Description:**

Harvest of crops (hay or small grains) using conservation measures that allow desired species to flush or escape. <species list 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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $209.27

**Scenario Cost/Unit:** $4.19

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 | $42.52 | 1.67 | $71.01 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $24.81 | 2 | $49.62 |

**Practice:** E511137Z2 - Forage harvest management that helps maintain or improve wildlife habitat (cover and shelter)

**Scenario** #1 - FHM for cover and shelter

**Scenario Description:**

The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such as way and time frames so as optimize both forage yield/quality and wildlife cover and shelter.

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $465.52

**Scenario Cost/Unit:** $4.66

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 | $16.65 | 25 | $416.25 |
| **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. | Hour | $49.27 | 1 | $49.27 |

**Practice:** E511139Z1 - Enhanced wildlife habitat on expired grass/legume covered CRP acres

**Scenario** #1 - FHM on expired CRP acres

**Scenario Description:**

Implement a forage management plan focused on wildlife habitat for the benefit of selected wildlife species on expired CRP grass/legume covered acres that have CRP conservation cover. Identify the target wildlife species or suite of species described in need of action within the State Wildlife Action Plan.

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $7,356.10

**Scenario Cost/Unit:** $147.12

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 | $42.52 | 166.5 | $7,079.58 |
| **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. | Hour | $44.32 | 4 | $177.28 |
| 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. | Hour | $24.81 | 4 | $99.24 |

**Practice:** E511139Z2 - Forage harvest management that helps maintain wildlife habitat continuity (space)

**Scenario** #1 - FHM for habitat space continuity

**Scenario Description:**

The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such as way and time frames so as optimize both forage yield/quality and wildlife cover and shelter for habitat 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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $209.27

**Scenario Cost/Unit:** $4.19

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 | $42.52 | 1.67 | $71.01 |
| **Labor** | | | | | | |
| Skilled Labor | 230 | Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc. | Hour | $44.32 | 2 | $88.64 |
| 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. | Hour | $24.81 | 2 | $49.62 |

**Practice:** E512101Z1 - Cropland conversion to grass-based agriculture to reduce water erosion

**Scenario** #1 - Convert crop to grass for water erosion

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $515.54

**Scenario Cost/Unit:** $5.16

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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2319 | Cool season, introduced grass and legume mix. Includes material and shipping only. | Acre | $20.85 | 20 | $417.00 |

**Practice:** E512101Z2 - Forage and biomass planting for water erosion to improve soil health

**Scenario** #1 - Forage planting for SH

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,479.74

**Scenario Cost/Unit:** $14.80

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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 20 | $1,381.20 |

**Practice:** E512102Z - Cropland conversion to grass-based agriculture to reduce wind erosion

**Scenario** #1 - Convert crop to grass for wind erosion

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,125.07

**Scenario Cost/Unit:** $11.25

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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 5 | $1,075.80 |

**Practice:** E512106Z1 - Cropland conversion to grass-based agriculture for soil organic matter improvement

**Scenario** #1 - Convert crop to grass for SOM

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,433.66

**Scenario Cost/Unit:** $14.34

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. | Hour | $24.81 | 2 | $49.62 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | $104.31 | 4 | $417.24 |
| **Materials** | | | | | | |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 20 | $966.80 |

**Practice:** E512106Z2 - Forage plantings that can help increase organic matter in depleted soils

**Scenario** #1 - Forage planting for SOM

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,481.59

**Scenario Cost/Unit:** $14.82

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 | $16.65 | 25 | $416.25 |
| **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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Four Species Mix, Cool Season, Introduced Perennial (2 grasses, 2 legumes) | 2317 | Cool season grass and legume mix. Includes material and shipping only. | Acre | $48.34 | 20 | $966.80 |

**Practice:** E512126Z - Cropland conversion to grass-based agriculture to reduce sediment loading

**Scenario** #1 - Convert crop to grass-reduce sed loading

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,239.87

**Scenario Cost/Unit:** $12.40

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. | Hour | $49.27 | 1 | $49.27 |
| **Materials** | | | | | | |
| Three Species Mix, Warm Season, Annual Grasses and Legumes | 2326 | Warm season annual grass and legume mix. Includes material and shipping only. | Acre | $59.53 | 20 | $1,190.60 |

**Practice:** E512132Z1 - Forage and biomass planting that produces feedstock for biofuels or energy production

**Scenario** #1 - Forage planting for feedstocks

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $3,661.62

**Scenario Cost/Unit:** $36.62

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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 50 | $3,453.00 |

**Practice:** E512132Z2 - Native grasses or legumes in forage base to improve plant productivity and health

**Scenario** #1 - Native grasses/legumes-plant health

**Scenario Description:**

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) 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,176.41

**Scenario Cost/Unit:** $21.76

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. | Hour | $24.81 | 1 | $24.81 |
| **Materials** | | | | | | |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 10 | $2,151.60 |

**Practice:** E512133Z1 - Native grasses or legumes in forage base to improve plant community structure and composition

**Scenario** #1 - Native grasses/legumes-structure/comp

**Scenario Description:**

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) 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,587.62

**Scenario Cost/Unit:** $55.88

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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 25 | $5,379.00 |

**Practice:** E512133Z2 - Forage plantings that enhance bird habitat (structure and composition)

**Scenario** #1 - Forage planting for structure/comp

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide cover and shelter components of bird habitat.

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $7,529.74

**Scenario Cost/Unit:** $75.30

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. | Hour | $44.32 | 2 | $88.64 |
| **Materials** | | | | | | |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 25 | $1,726.50 |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 10 | $5,714.60 |

**Practice:** E512136Z1 - Establish pollinator and/or beneficial insect food habitat

**Scenario** #1 - Establish pollinator habitat-food

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,818.91

**Scenario Cost/Unit:** $58.19

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. | Hour | $104.31 | 1 | $104.31 |
| **Materials** | | | | | | |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 10 | $5,714.60 |

**Practice:** E512136Z2 - Native grass or legumes in forage base to provide wildlife food

**Scenario** #1 - Native grasses/legumes-wildlife food

**Scenario Description:**

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) 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,818.91

**Scenario Cost/Unit:** $58.19

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. | Hour | $104.31 | 1 | $104.31 |
| **Materials** | | | | | | |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 10 | $5,714.60 |

**Practice:** E512137Z - Forage plantings that enhance bird habitat (cover and shelter)

**Scenario** #1 - Forage planting for cover and shelter

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide cover and shelter components of bird habitat.

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $7,529.74

**Scenario Cost/Unit:** $75.30

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. | Hour | $44.32 | 2 | $88.64 |
| **Materials** | | | | | | |
| One Species, Warm Season, Native Perennial Grass | 2322 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $69.06 | 25 | $1,726.50 |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 10 | $5,714.60 |

**Practice:** E512138Z - Establish wildlife corridors to enhance access to water

**Scenario** #1 - Corridors for water access

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,666.39

**Scenario Cost/Unit:** $26.66

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 | $16.65 | 25 | $416.25 |
| **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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 10 | $2,151.60 |

**Practice:** E512139Z1 - Establish wildlife corridors to provide habitat continuity

**Scenario** #1 - Corridors for habitat continuity

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,554.20

**Scenario Cost/Unit:** $25.54

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. | Acre | $23.61 | 10 | $236.10 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 10 | $166.50 |
| **Materials** | | | | | | |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 10 | $2,151.60 |

**Practice:** E512139Z2 - Establish pollinator and/or beneficial insect habitat continuity (space)

**Scenario** #1 - Establish pollinator habitat-space

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,923.22

**Scenario Cost/Unit:** $59.23

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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 10 | $5,714.60 |

**Practice:** E512139Z3 - Establish Monarch butterfly habitat in pastures

**Scenario** #1 - Establish Monarch Butterfly Habitat in pastures

**Scenario Description:**

Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for Monarch butterflies 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,923.22

**Scenario Cost/Unit:** $59.23

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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Three Species Mix, Native Forb | 2333 | Native forb mix. Includes material and shipping only. | Acre | $571.46 | 10 | $5,714.60 |

**Practice:** E512140Z - Native grasses or legumes in forage base

**Scenario** #1 - Native grasses or legumes in forage base

**Scenario Description:**

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) 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $5,477.54

**Scenario Cost/Unit:** $54.78

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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Three plus Species Mix, Warm Season, Native Perennial | 2327 | Native, warm season perennial grass. Includes material and shipping only. | Acre | $215.16 | 25 | $5,379.00 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528104Z - Grazing management that protects sensitive areas from gully erosion

**Scenario** #1 - Grazing mgmt-sensitive areas-erosion

**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::** Acre

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $1,682.69

**Scenario Cost/Unit:** $1.68

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 12 | $375.12 |
| **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. | Hour | $24.81 | 17 | $421.77 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polytape | 7 | Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only. | Each | $50.07 | 1 | $50.07 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528105Z - Prescribed grazing that improves or maintains riparian and watershed function-erosion

**Scenario** #1 - Prescribed grazing-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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $944.10

**Scenario Cost/Unit:** $9.44

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 | $63.92 | 1 | $63.92 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 10 | $166.50 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 1 | $47.61 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528107Z1 - Improved grazing management for soil compaction through monitoring activities

**Scenario** #1 - Grazing mgmt to improve compaction

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a Certified Forage and Grassland Professional, Certified Range Management Consultant, or Certified Professional in Range Management, 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $781.52

**Scenario Cost/Unit:** $7.82

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 | $16.65 | 10 | $166.50 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| 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. | Hour | $104.31 | 4 | $417.24 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528118Z1 - Prescribed grazing that maintains/improves riparian/watershed function impairment from nutrients

**Scenario** #1 - Prescribed grazing-nut runoff

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,530.55

**Scenario Cost/Unit:** $15.31

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 6 | $187.56 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 10 | $166.50 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 4 | $190.44 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528119Z - Grazing management that protects sensitive areas-ground water from nutrients

**Scenario** #1 - Grazing mgmt-sensitive area-nut sub water

**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::** Acre

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $1,832.90

**Scenario Cost/Unit:** $1.83

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 12 | $375.12 |
| **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. | Hour | $24.81 | 17 | $421.77 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polytape | 7 | Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only. | Each | $50.07 | 4 | $200.28 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528122Z - Prescribed grazing that maintains/improves riparian/watershed function-pathogens/chemicals

**Scenario** #1 - Prescribed grazing-pathogens

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,530.55

**Scenario Cost/Unit:** $15.31

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 6 | $187.56 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 10 | $166.50 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 4 | $190.44 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528126Z - Prescribed grazing that maintains/improves riparian/watershed function-min sediment in surface water

**Scenario** #1 - Prescribed grazing-sediment

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,364.05

**Scenario Cost/Unit:** $13.64

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 6 | $187.56 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 4 | $190.44 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |

**Practice:** E528132Z1 - Improved grazing mgmt for plant productivity/health through monitoring

**Scenario** #1 - Grazing mgmt-plant health

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a Certified Forage and Grassland Professional, Certified Range Management Consultant, or Certified Professional in Range Management, 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $926.78

**Scenario Cost/Unit:** $9.27

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 | $16.65 | 30 | $499.50 |
| **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. | Hour | $104.31 | 4 | $417.24 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 1 | $10.04 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528132Z2 - Stockpiling cool season forage to improve plant productivity and health

**Scenario** #1 - Stockpile cool season forage-plant prod

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,417.84

**Scenario Cost/Unit:** $24.18

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 6 | $187.56 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 10 | $166.50 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 1 | $47.61 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| 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 | $0.50 | 2000 | $1,000.00 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 3 | $30.12 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528133Z1 - Stockpiling cool season forage to improve structure and composition.

**Scenario** #1 - Stockpile cool season forage-structure

**Scenario Description:**

Grazing management employed will 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $2,417.84

**Scenario Cost/Unit:** $24.18

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 6 | $187.56 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 10 | $166.50 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 1 | $47.61 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| 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 | $0.50 | 2000 | $1,000.00 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 3 | $30.12 |

**Practice:** E528133Z2 - Grazing management for improving quantity/quality of plant structure/composition for wildlife

**Scenario** #1 - Grazing mgmt-structure for wildlife

**Scenario Description:**

Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving or maintaining 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $299.02

**Scenario Cost/Unit:** $2.99

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 | $16.65 | 15 | $249.75 |
| **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. | Hour | $49.27 | 1 | $49.27 |

**Practice:** E528136Z1 - Grazing management for improving quantity and quality of food for wildlife

**Scenario** #1 - Grazing mgmt-food

**Scenario Description:**
Grazing management employed will provide plant structure, density and diversity needed 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::** Acre

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $556.62

**Scenario Cost/Unit:** $0.56

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 | $63.92 | 1 | $63.92 |
| **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. | Hour | $49.27 | 10 | $492.70 |

**Practice:** E528137Z1 - Grazing management for improving quantity and quality of cover and shelter for wildlife

**Scenario** #1 - Grazing mgmt-shelter

**Scenario Description:**
Grazing management employed will provide plant structure, density and diversity needed 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::** Acre

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $556.62

**Scenario Cost/Unit:** $0.56

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 | $63.92 | 1 | $63.92 |
| **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. | Hour | $49.27 | 10 | $492.70 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528137Z2 - Incorporating wildlife refuge areas in contingency plans for prescribed grazing-cover/shelter

**Scenario** #1 - Add wildlife refuge area-shelter

**Scenario Description:**

A prescribed grazing plan that includes 12 month (or longer) deferment of a pasture 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 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,613.80

**Scenario Cost/Unit:** $16.14

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 6 | $187.56 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 15 | $249.75 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 4 | $190.44 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528138Z - Incorporating wildlife refuge areas in contingency plans for prescribed grazing-water access

**Scenario** #1 - Add wildlife refuge area-water

**Scenario Description:**

A prescribed grazing plan that includes 12 month (or longer) deferment of a pasture 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 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,613.80

**Scenario Cost/Unit:** $16.14

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 6 | $187.56 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 15 | $249.75 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 4 | $190.44 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E528140Z1 - Maintaining quantity and quality of forage for animal health and productivity

**Scenario** #1 - Maintain forage quantity and quality

**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..

**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::** Acre

**Scenario Typical Size:** 1,000.0

**Scenario Total Cost:** $2,521.67

**Scenario Cost/Unit:** $2.52

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 | $63.92 | 1 | $63.92 |
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 4 | $96.32 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 12 | $375.12 |
| **Foregone Income** | | | | | | |
| FI, Grazing AUMs | 2079 | Grazing is the Primary Land Use | Animal Unit Month | $16.65 | 36 | $599.40 |
| **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. | Hour | $24.81 | 17 | $421.77 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | $49.27 | 2 | $98.54 |
| **Materials** | | | | | | |
| Wire, Polywire | 8 | Wire, Polywire for electric fence - 1,300 roll. Includes materials and shipping only. | Each | $47.61 | 1 | $47.61 |
| Electric, Energizer, Solar | 27 | Electric, Energizer, Solar for electric fence. Includes materials and shipping only. | Each | $319.43 | 1 | $319.43 |
| Tank, Polyethylene, 300 gallon | 291 | Portable heavy duty rubber stock tank. | Each | $257.52 | 1 | $257.52 |
| Nutritional Balance Analyzer, fecal sample analysis only | 1127 | NIRS fecal analysis, animal performance report. Includes materials and shipping only. | Each | $40.34 | 6 | $242.04 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E554118Z1 - Installation of end of pipe or ditch treatment for phosphorus

**Scenario** #1 - Installation of treatment for P

**Scenario Description:**

Add end of pipe treatment. If dissolved Phosphorus is the pollutant of concern, add Interim standard 782, Phosphorus Treatment Structure for each pipe outlet in a field.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 554 - Drainage Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 554 - Drainage Water Management

**Feature Measure:** Each

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $8,254.68

**Scenario Cost/Unit:** $8,254.68

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 Yard | $502.23 | 6 | $3,013.38 |
| 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 Yard | $2.56 | 40 | $102.40 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 40 | $158.40 |
| 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. | Hour | $69.35 | 16 | $1,109.60 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $104.31 | 4 | $417.24 |
| **Materials** | | | | | | |
| Aggregate, Gravel, Graded | 46 | Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel. | Cubic Yard | $31.25 | 20 | $625.00 |
| Pipe, PVC, 4", SDR 41 | 983 | Materials: - 4" - PVC - SDR 41 100 psi - ASTM D2241 | Foot | $1.92 | 80 | $153.60 |
| Tank, Poly enclosed Storage, 300-1000 gal | 1074 | Water storage tanks. Includes materials and shipping only. | Gallon | $0.90 | 0 | $0.00 |
| Aggregate, gravel, washed, pea gravel | 1331 | Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry. | Cubic Yard | $34.45 | 20 | $689.00 |
| 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. Fixed cost portion. Materials only. | Each | $312.56 | 1 | $312.56 |
| 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 | $12.08 | 36 | $434.88 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |
| 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 | $0.39 | 400 | $156.00 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E554118Z2 - Installation of a saturated buffer drain outlet

**Scenario** #1 - Installation of a vegetated outlet

**Scenario Description:**

Install Conservation Practice Standard 604, Saturated Buffer so all of the drain outlets on a field are routed through an appropriate buffer.

**Before Situation:**

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 554 - Drainage Water Management

**After Situation:**

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 554 - Drainage Water Management

**Feature Measure:** Acre

**Scenario Unit::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $3,745.34

**Scenario Cost/Unit:** $3,745.34

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Trenching, Earth, 12" x 48" | 53 | Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling | Foot | $1.50 | 400 | $600.00 |
| Backhoe, 80 HP | 926 | Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $61.96 | 4 | $247.84 |
| **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. | Hour | $24.81 | 4 | $99.24 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 4 | $100.72 |
| 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. | Hour | $49.27 | 4 | $197.08 |
| **Materials** | | | | | | |
| Pipe, HDPE, 5", PCPT, Single Wall | 1271 | Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 5" diameter - ASTM F405. Material cost only. | Foot | $0.71 | 400 | $284.00 |
| Water Level Control Structure, Inline, 2 Baffle, 10" diameter | 2021 | Inline Inlet WCS 6' High x 10" Dia.connections , 2 baffle (3 compartments) | Each | $1,933.68 | 1 | $1,933.68 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E554118Z3 - Installation of end of pipe or ditch treatment for nitrogen

**Scenario** #1 - Installation of treatment for N

**Scenario Description:**
Add end of pipe/ditch treatment if Nitrogen is the pollutant of concern. Add CPS 605, Denitrifying Bioreactor for each drainage outlet in a field.

**Before Situation:**
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 554 - Drainage Water Management

**After Situation:**
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 554 - Drainage Water Management

**Feature Measure:** Each

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $20,430.47

**Scenario Cost/Unit:** $20,430.47

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 | $2.77 | 800 | $2,216.00 |
| 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 Yard | $2.56 | 333 | $852.48 |
| Earthfill, Dumped and Spread | 51 | Earthfill, dumped and spread without compaction effort, includes equipment and labor | Cubic Yard | $3.96 | 333 | $1,318.68 |
| Skidsteer, 80 HP | 933 | Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included. | Hour | $49.30 | 8 | $394.40 |
| Aggregate, Wood Chips | 1098 | Includes materials, equipment and labor | Cubic Yard | $24.76 | 366 | $9,062.16 |
| Trenching, Earth, 24" x 60" | 1460 | Trenching, earth, 24" wide x 60" depth, includes equipment and labor for trenching and backfilling. | Foot | $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. | Hour | $24.81 | 16 | $396.96 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| **Materials** | | | | | | |
| Pipe, HDPE, 6", CPT, Single Wall | 1242 | Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only. | Foot | $1.13 | 90 | $101.70 |
| Water Level Control Structure, Inline, 2 Baffle, 10" diameter | 2021 | Inline Inlet WCS 6' High x 10" Dia.connections , 2 baffle (3 compartments) | Each | $1,933.68 | 1 | $1,933.68 |
| 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. Fixed cost portion. Materials only. | Each | $312.56 | 1 | $312.56 |
| 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 | $12.08 | 60 | $724.80 |
| Water Level Control Structure, Inline, 2 Baffle, 8" diameter | 2187 | Inline Inlet WCS 6' High x 8" Dia.connections , 2 baffle (3 compartments) | Each | $1,730.56 | 1 | $1,730.56 |
| Pipe, HDPE, CPT, Double Wall, Water Tight, 10" | 2204 | Pipe, Corrugated HDPE Double Wall 10" diameter with water tight joints meeting ASTM F477. Material cost only. | Foot | $5.47 | 40 | $218.80 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E578139X - 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:** 1.0

**Scenario Total Cost:** $8,390.20

**Scenario Cost/Unit:** $8,390.20

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. | Hour | $73.10 | 16 | $1,169.60 |
| 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. | Hour | $125.73 | 8 | $1,005.84 |
| 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. | Acre | $13.93 | 0.1 | $1.39 |
| Truck, dump, 12 CY | 1215 | Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only. | Hour | $106.91 | 16 | $1,710.56 |
| **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. | Hour | $24.81 | 32 | $793.92 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 32 | $805.76 |
| 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. | Hour | $49.27 | 16 | $788.32 |
| **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 | $1.30 | 300 | $390.00 |
| Cuttings, woody, medium size | 1308 | Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only. | Each | $0.48 | 300 | $144.00 |
| Aggregate, river rock | 1834 | Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery | Ton | $26.21 | 42 | $1,100.82 |
| One Species, Cool Season, Annual Grass or Legume | 2311 | Cool season annual grass or legume. Includes material and shipping only. | Acre | $38.26 | 0.1 | $3.83 |
| One Species, Cool Season, Introduced Perennial Grass | 2313 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $31.86 | 0.1 | $3.19 |
| **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 | $190.19 | 1 | $190.19 |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 1 | $282.78 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E580105Z - Stream corridor bank stability improvement

**Scenario** #1 - Stream 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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $3,936.69

**Scenario Cost/Unit:** $1,968.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 8 | $250.08 |
| 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. | Hour | $7.12 | 8 | $56.96 |
| 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. | Hour | $12.04 | 8 | $96.32 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, potted, 1/2 to 1 gal. | 1526 | Potted shrub, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.52 | 65 | $293.80 |
| Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal. | 1531 | Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.54 | 65 | $295.10 |
| Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal. | 1536 | Potted conifer, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.41 | 65 | $286.65 |
| Tree shelter, mesh tree tube, 48" | 1556 | 48" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.09 | 65 | $70.85 |
| Tree shelter, solid tube type, 4" x 24" | 1563 | 4" x 24" tree tube for protection from animal damage. Materials only. | Each | $2.19 | 65 | $142.35 |
| Tree shelter, solid tube type, 4" x 48" | 1566 | 4" x 48" tree tube for protection from animal damage. Materials only. | Each | $4.14 | 65 | $269.10 |
| Stakes, wood, 1" x 1" x 48" | 1578 | 1" x 1" x 48" wood stakes to fasten items in place. Includes materials only. | Each | $2.04 | 195 | $397.80 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E580137Z - Stream corridor bank vegetation improvement

**Scenario** #1 - Stream corridor bank veg 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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $3,936.69

**Scenario Cost/Unit:** $1,968.35

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 8 | $192.64 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 8 | $250.08 |
| 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. | Hour | $7.12 | 8 | $56.96 |
| 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. | Hour | $12.04 | 8 | $96.32 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| 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. | Hour | $49.27 | 8 | $394.16 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, potted, 1/2 to 1 gal. | 1526 | Potted shrub, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.52 | 65 | $293.80 |
| Tree, hardwood, seedling or transplant, potted, 1/2 to 1 gal. | 1531 | Potted hardwood tree, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.54 | 65 | $295.10 |
| Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal. | 1536 | Potted conifer, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.41 | 65 | $286.65 |
| Tree shelter, mesh tree tube, 48" | 1556 | 48" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only. | Each | $1.09 | 65 | $70.85 |
| Tree shelter, solid tube type, 4" x 24" | 1563 | 4" x 24" tree tube for protection from animal damage. Materials only. | Each | $2.19 | 65 | $142.35 |
| Tree shelter, solid tube type, 4" x 48" | 1566 | 4" x 48" tree tube for protection from animal damage. Materials only. | Each | $4.14 | 65 | $269.10 |
| Stakes, wood, 1" x 1" x 48" | 1578 | 1" x 1" x 48" wood stakes to fasten items in place. Includes materials only. | Each | $2.04 | 195 | $397.80 |

**Practice:** E590118X - Reduce risks of nutrient losses to surface water by utilizing precision ag technologies

**Scenario** #1 - Precision ag for nut reduction

**Scenario Description:**

Utilize precision application technology and techniques to reduce risk of nutrients in surface water by reducing total amount of applied and reducing the potential for delivery of nutrients into water bodies. Precision agriculture technology is 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,645.37

**Scenario Cost/Unit:** $16.45

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. | Acre | $11.79 | 100 | $1,179.00 |
| **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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Test, Soil Test, Precision, Grid or Zone DELETION SCHEDULED for PS FY 2018 , USE CID 299 | 300 | Includes materials, shipping, labor, and equipment costs. DELETION SCHEDULED for PS FY 2018 , USE CID 299 | Each | $10.31 | 25 | $257.75 |

**Practice:** E590118Z - Improving nutrient uptake efficiency and reducing risk of nutrient losses to surface water

**Scenario** #1 - Nut mgmt for surface water

**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.

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,126.82

**Scenario Cost/Unit:** $11.27

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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acre | $8.55 | 100 | $855.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $12.64 | 5 | $63.20 |

**Practice:** E590119Z - Improving nutrient uptake efficiency and reducing risk of nutrient losses to groundwater

**Scenario** #1 - Nut mgmt for groundwater

**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.

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,126.82

**Scenario Cost/Unit:** $11.27

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. | Hour | $104.31 | 2 | $208.62 |
| **Materials** | | | | | | |
| Nitrogen-Urease inhibitor | 260 | Nitrogen-Urease inhibitor | Acre | $8.55 | 100 | $855.00 |
| Test, Soil Nitrogen Testing | 311 | Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only. | Each | $12.64 | 5 | $63.20 |

**Practice:** E595116X - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

**Scenario** #1 - Pest mgmt for surface water

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,401.93

**Scenario Cost/Unit:** $14.02

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. | Acre | $10.89 | 100 | $1,089.00 |
| **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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E595116Z - Reduce risk of pesticides in surface water by utilizing IPM PAMS techniques

**Scenario** #1 - IPM PAMS techniques

**Scenario Description:**

Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce risk of pesticides in surface water 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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $756.13

**Scenario Cost/Unit:** $7.56

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. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E595129Z - Reduce ozone precursor emissions related to pesticides by utilizing IPM PAMS techniques

**Scenario** #1 - IPM PAMS techniques for ozone reduction

**Scenario Description:**

Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce ozone precursor emissions related to pesticides.

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $756.13

**Scenario Cost/Unit:** $7.56

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. | Hour | $44.32 | 10 | $443.20 |
| 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. | Hour | $104.31 | 3 | $312.93 |

**Practice:** E612101Z - Cropland conversion to trees or shrubs for long term water erosion control

**Scenario** #1 - Convert crop to trees-water erosion

**Scenario Description:**

Conversion of cropped land to trees for long term erosion control and improvement of water quality. Trees 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) 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $7,622.30

**Scenario Cost/Unit:** $762.23

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. | Acre | $23.61 | 10 | $236.10 |
| Ripper or subsoiler, 16 to 36 inch depth | 1235 | Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor. | Acre | $22.03 | 10 | $220.30 |
| **Materials** | | | | | | |
| Tree or shrub seedling, Tropical, native or non-native, 1 gal | 1543 | tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only. | Each | $13.85 | 500 | $6,925.00 |
| Four Species Mix, Cool Season, Introduced Perennial Grass | 2318 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $24.09 | 10 | $240.90 |

**Practice:** E612102Z - Cropland conversion to trees or shrubs for long term wind erosion control

**Scenario** #1 - Convert crop to trees-wind erosion

**Scenario Description:**

Conversion of cropped land to trees for long term erosion control and improvement of water quality. Trees 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) 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $7,622.30

**Scenario Cost/Unit:** $762.23

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. | Acre | $23.61 | 10 | $236.10 |
| Ripper or subsoiler, 16 to 36 inch depth | 1235 | Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor. | Acre | $22.03 | 10 | $220.30 |
| **Materials** | | | | | | |
| Tree or shrub seedling, Tropical, native or non-native, 1 gal | 1543 | tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only. | Each | $13.85 | 500 | $6,925.00 |
| Four Species Mix, Cool Season, Introduced Perennial Grass | 2318 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $24.09 | 10 | $240.90 |

**Practice:** E612126Z - Cropland conversion to trees or shrubs for long term improvement of water quality

**Scenario** #1 - Convert crop to trees-WQ

**Scenario Description:**

Conversion of cropped land to trees for long term erosion control and improvement of water quality. Trees 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) 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $7,622.30

**Scenario Cost/Unit:** $762.23

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. | Acre | $23.61 | 10 | $236.10 |
| Ripper or subsoiler, 16 to 36 inch depth | 1235 | Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor. | Acre | $22.03 | 10 | $220.30 |
| **Materials** | | | | | | |
| Tree or shrub seedling, Tropical, native or non-native, 1 gal | 1543 | tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only. | Each | $13.85 | 500 | $6,925.00 |
| Four Species Mix, Cool Season, Introduced Perennial Grass | 2318 | Introduced, cool season perennial grass. Includes material and shipping only. | Acre | $24.09 | 10 | $240.90 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E612130Z - Planting for high carbon sequestration rate

**Scenario** #1 - Planting for high carbon sequestration

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $9,266.05

**Scenario Cost/Unit:** $926.61

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 6 | $144.48 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 4 | $27.12 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| Tractor, agricultural, 60 HP | 963 | Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included. | Hour | $27.38 | 6 | $164.28 |
| 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. | Hour | $6.84 | 6 | $41.04 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 4 | $1,504.60 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 4 | $1,447.88 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 2 | $539.24 |
| **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. | Hour | $24.81 | 6 | $148.86 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 6 | $151.08 |
| 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. | Hour | $49.27 | 6 | $295.62 |
| **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. | Acre | $17.48 | 4 | $69.92 |
| 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. | Acre | $25.63 | 4 | $102.52 |
| 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 shi | Acre | $1.28 | 3 | $3.84 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 7260 | $4,428.60 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E612132Z - Establishing tree/shrub species to restore native plant communities

**Scenario** #1 - Tree/shrubs-restore native 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::** Acre

**Scenario Typical Size:** 5.0

**Scenario Total Cost:** $3,183.92

**Scenario Cost/Unit:** $636.78

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| 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. | Hour | $12.04 | 12 | $144.48 |
| **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. | Hour | $24.81 | 12 | $297.72 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **Materials** | | | | | | |
| Shrub, seedling or transplant, potted, 1/2 to 1 gal. | 1526 | Potted shrub, 1/2 to 1 gal. Includes materials and shipping only. | Each | $4.52 | 50 | $226.00 |
| Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal. | 1532 | Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only. | Each | $7.15 | 100 | $715.00 |
| Tree, conifer, seedling or transplant, potted or B&B, 2-3 gal. | 1537 | Potted or balled and burlapped conifer tree, 2-3 gal. Includes materials and shipping only. | Each | $6.97 | 100 | $697.00 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 150 | $768.00 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E612133X1 - Adding food-producing trees and shrubs to existing plantings

**Scenario** #1 - Adding food-producing trees and shrubs

**Scenario Description:**

Plant food-producing trees and shrubs for wildlife or human consumption within windbreaks, alley cropping, multi-story cropping, or silvopasture systems, 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:** Each

**Scenario Unit::** Each

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,406.33

**Scenario Cost/Unit:** $1,406.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| 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. | Hour | $12.04 | 10 | $120.40 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 341 | $194.37 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 340 | $207.40 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** E612133X2 - 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, medicinals, 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,419.97

**Scenario Cost/Unit:** $1,419.97

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| 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. | Hour | $12.04 | 10 | $120.40 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 681 | $415.41 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E612133X3 - Sugarbush management

**Scenario** #1 - Sugarbush management

**Scenario Description:**

Maintain at least 20% of basal area in species other than sugar maple to provide species diversity. Half of the trees that are not sugar maples (10%) will be mast-producing species. 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:** Each

**Scenario Unit::** Each

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $690.28

**Scenario Cost/Unit:** $34.51

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 2 | $9.66 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| 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. | Hour | $71.74 | 1 | $71.74 |
| 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. | Hour | $12.04 | 2 | $24.08 |
| **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. | Hour | $24.81 | 10 | $248.10 |
| **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. | Acre | $17.48 | 0.5 | $8.74 |
| Tree, hardwood, seedling or transplant, potted or B&B, 2-3 gal. | 1532 | Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only. | Each | $7.15 | 20 | $143.00 |
| Tree shelter, solid tube type, 4" x 60" | 1567 | 4" x 60" tree tube for protection from animal damage. Materials only. | Each | $5.12 | 20 | $102.40 |
| Cable ties, plastic | 1575 | Plastic cable ties (typ. 8-12") to assist in securing items. Materials only. | Each | $0.05 | 60 | $3.00 |
| Stakes, wood, 3/4" x 3/4" x 60" | 1583 | 3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only. | Each | $1.57 | 20 | $31.40 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E612136Z - 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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,519.24

**Scenario Cost/Unit:** $1,519.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| 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. | Hour | $12.04 | 11 | $132.44 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **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. | Hour | $24.81 | 11 | $272.91 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 605 | $344.85 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 218 | $132.98 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E612137Z - Tree/shrub planting for wildlife cover

**Scenario** #1 - Tree/shrub planting for wildlife cover

**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::** Acre

**Scenario Typical Size:** 1.0

**Scenario Total Cost:** $1,519.24

**Scenario Cost/Unit:** $1,519.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 1 | $6.78 |
| 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. | Hour | $12.04 | 11 | $132.44 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.36 | $130.31 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.23 | $62.01 |
| **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. | Hour | $24.81 | 11 | $272.91 |
| **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. | Acre | $17.48 | 1 | $17.48 |
| 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. | Acre | $25.63 | 1 | $25.63 |
| 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 shi | Acre | $1.28 | 1 | $1.28 |
| Shrub, seedling or transplant, bare root, 18"-36" | 1507 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.57 | 605 | $344.85 |
| Tree, hardwood, seedling or transplant, bare root, 16-36" | 1510 | Bare root hardwood trees 18-36" tall. Includes materials and shipping only. | Each | $0.61 | 218 | $132.98 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** E645137Z - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

**Scenario** #1 - Reduce human-subsidized predators

**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::** Acre

**Scenario Typical Size:** 40.0

**Scenario Total Cost:** $3,627.47

**Scenario Cost/Unit:** $90.69

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 72 | $1,733.76 |
| 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. | Hour | $7.12 | 72 | $512.64 |
| **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. | Hour | $24.81 | 48 | $1,190.88 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E646137X - Renovate small, shallow pothole and playa sites which may seasonally hold water

**Scenario** #1 - Shallow water development and management

**Scenario Description:**
Renovate small, shallow pothole and playa sites which may seasonally hold water.

**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::** Acre

**Scenario Typical Size:** 4.0

**Scenario Total Cost:** $7,425.92

**Scenario Cost/Unit:** $1,856.48

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 Yard | $2.56 | 1613 | $4,129.28 |
| Chemical, ground application | 948 | Chemical application performed by ground equipment. Includes equipment, power unit and labor costs. | Acre | $6.78 | 4 | $27.12 |
| Seeding Operation, No Till/Grass Drill | 960 | No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs. | Acre | $23.61 | 3 | $70.83 |
| **Foregone Income** | | | | | | |
| FI, Corn Dryland | 1959 | Dryland Corn is Primary Crop | Acre | $376.15 | 0.41 | $154.22 |
| FI, Soybeans Dryland | 1961 | Dryland Soybeans is Primary Crop | Acre | $361.97 | 0.23 | $83.25 |
| FI, Wheat Dryland | 1963 | Dryland Wheat is Primary Crop | Acre | $269.62 | 0.36 | $97.06 |
| **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. | Acre | $37.13 | 4 | $148.52 |
| Six Species Mix, Native Forb | 2334 | Native forb mix. Includes material and shipping only. | Acre | $960.66 | 2 | $1,921.32 |
| Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration | 2335 | Native grass and forb/legume mix, including specialized species. Includes material and shipping only. | Acre | $254.41 | 1 | $254.41 |
| **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 | $539.90 | 1 | $539.90 |

**Practice:** E647136Z1 - Manipulate vegetation on fields where rainfall is to be captured and retained-food

**Scenario** #1 - Manipulate veg for food

**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. 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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,277.24

**Scenario Cost/Unit:** $25.54

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. | Hour | $63.78 | 8 | $510.24 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** E647136Z3 - Establish and maintenance of moist soil vegetation on cropland edges to increase wildlife food

**Scenario** #1 - Moist soil vegetation-food

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $628.06

**Scenario Cost/Unit:** $12.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 3 | $172.14 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 3 | $75.54 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** E647137Z1 - Manipulate vegetation on fields where rainfall is to be captured and retained-cover/shelter

**Scenario** #1 - Manipulate veg for cover/shelter

**Scenario Description:**

This enhancement is to provide cover and shelter for wildlife by retaining some standing rice stubble and by encouraging the establishment of early successional, naturally occurring vegetation in fields post harvest. Allowing some standing rice stubble and naturally occurring vegetation to develop will help provide food and cover for wildlife while enhancing aquatic habitat and improving 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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $1,277.24

**Scenario Cost/Unit:** $25.54

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. | Hour | $63.78 | 8 | $510.24 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| **Mobilization** | | | | | | |
| Mobilization, medium equipment | 1139 | Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | $282.78 | 2 | $565.56 |

**Practice:** E647137Z2 - Establish and maintenance of moist soil vegetation on cropland edges to increase cover/shelter

**Scenario** #1 - Moist soil vegetation-cover/shelter

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $628.06

**Scenario Cost/Unit:** $12.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 3 | $172.14 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 3 | $75.54 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** E647139Z1 - Establish/maintain habitat continuity, naturally occurring vegetation in ditches/ditch bank borders

**Scenario** #1 - Naturally occurring veg in ditches

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $628.06

**Scenario Cost/Unit:** $12.56

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Mower, Bush Hog | 940 | Equipment and power unit costs. Labor not included. | Hour | $57.38 | 3 | $172.14 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 3 | $75.54 |
| **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 | $190.19 | 2 | $380.38 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666106Z2 - Maintaining and improving forest soil quality

**Scenario** #1 - Maintain/improve forest SQ

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $2,387.48

**Scenario Cost/Unit:** $47.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 4 | $19.32 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 4 | $125.04 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $104.31 | 10 | $1,043.10 |
| 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 t | Hour | $71.89 | 8 | $575.12 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 10 | $100.40 |
| 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. | Acre | $6.96 | 5 | $34.80 |
| Certified Organic, Three plus Species Mix, Cool Season, Annual Grasses and Legumes | 2343 | Certified organic cool season annual grass and legume mix. Includes material and shipping only. | Acre | $81.02 | 3 | $243.06 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666107Z - Maintaining and improving forest soil quality by limiting compaction

**Scenario** #1 - Maintain/improve forest compaction

**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::** Acre

**Scenario Typical Size:** 50.0

**Scenario Total Cost:** $2,387.48

**Scenario Cost/Unit:** $47.75

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 4 | $19.32 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 4 | $125.04 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| 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. | Hour | $104.31 | 10 | $1,043.10 |
| 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 t | Hour | $71.89 | 8 | $575.12 |
| **Materials** | | | | | | |
| Test, Soil Test, Standard | 299 | Includes materials, shiping, labor, and equipment costs. | Each | $10.04 | 10 | $100.40 |
| 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. | Acre | $6.96 | 5 | $34.80 |
| Certified Organic, Three plus Species Mix, Cool Season, Annual Grasses and Legumes | 2343 | Certified organic cool season annual grass and legume mix. Includes material and shipping only. | Acre | $81.02 | 3 | $243.06 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666115Z2 - Enhance development of the forest understory to improve site moisture

**Scenario** #1 - Forest understory to improve moisture

**Scenario Description:**

Forest stand improvement to manage the structure and composition of overstory and understory vegetation so that additional moisture is captured and filtered through the vegetation and soil. Managing the understory vegetation will increase available water to the plants, minimize run-off and erosion, and improve water quality.

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,765.44

**Scenario Cost/Unit:** $238.27

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. | Hour | $84.38 | 16 | $1,350.08 |
| 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. | Hour | $71.74 | 16 | $1,147.84 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **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. | Acre | $37.13 | 20 | $742.60 |

**Practice:** E666118Z - Enhance development of the forest understory to capture nutrients in surface water

**Scenario** #1 - Understory-nutrients in surface water

**Scenario Description:**

Forest stand improvement to manage the structure and composition of overstory and understory vegetation so that additional moisture is captured and filtered through the vegetation and soil, thus minimizing nutrient movement in surface water. Managing the understory vegetation will increase available water to the plants, minimize run-off and erosion, and improve water quality.

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,765.44

**Scenario Cost/Unit:** $238.27

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. | Hour | $84.38 | 16 | $1,350.08 |
| 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. | Hour | $71.74 | 16 | $1,147.84 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **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. | Acre | $37.13 | 20 | $742.60 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666119Z - Enhance development of the forest understory to capture nutrients -ground water

**Scenario** #1 - Understory-nutrients in ground water

**Scenario Description:**

Forest stand improvement to manage the structure and composition of overstory and understory vegetation so that additional moisture is captured and filtered through the vegetation and soil, thus minimizing nutrient loss through ground water. Managing the understory vegetation will increase available water to the plants, minimize run-off and erosion, and improve water quality.

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,765.44

**Scenario Cost/Unit:** $238.27

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. | Hour | $84.38 | 16 | $1,350.08 |
| 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. | Hour | $71.74 | 16 | $1,147.84 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **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. | Acre | $37.13 | 20 | $742.60 |

**Practice:** E666130Z - Increase on-site carbon storage

**Scenario** #1 - Increase on-site carbon storage

**Scenario Description:**

Utilize forest management techniques to increase on-site carbon storage, including uneven-aged management, longer rotations, leave-tree retention, snags and down woody debris, and soil organic ma

**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::** Acre

**Scenario Typical Size:** 100.0

**Scenario Total Cost:** $1,222.13

**Scenario Cost/Unit:** $12.22

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 t | Hour | $71.89 | 17 | $1,222.13 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666132Z1 - 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $3,752.36

**Scenario Cost/Unit:** $375.24

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 25 | $120.75 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 6 | $144.48 |
| 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. | Hour | $71.74 | 25 | $1,793.50 |
| **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. | Hour | $24.81 | 25 | $620.25 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | $104.31 | 8 | $834.48 |
| **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. | Acre | $6.96 | 10 | $69.60 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acre | $16.93 | 10 | $169.30 |

**Practice:** E666132Z2 - Reduce forest stand density to improve a degraded plant community

**Scenario** #1 - Forest density-degraded plant community

**Scenario Description:**

Open pine or conifer management reduces the number of trees per acre while still maintaining the stand as forest land. It restores elements of stand structure that were formerly created by fire on sites where it is not currently feasible to conduct prescribed burning at the intensity needed to open the canopy. The open stand condition allows a significant amount of sunlight to reach the forest floor and stimulate understory vegetation. The initial treatment creates a stand structure that allows prescribed burning to be applied to limit redevelopment of the woody component of the understory and maintain open conditions. The vegetation management, and wide spacing between trees or clumps of trees, provides visual appeal, reduces the risk of wildfire, and provides wildlife habitat for many at-risk and listed 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $5,680.83

**Scenario Cost/Unit:** $284.04

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. | Hour | $84.38 | 20 | $1,687.60 |
| 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. | Hour | $71.74 | 20 | $1,434.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 20 | $503.60 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **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. | Acre | $37.13 | 20 | $742.60 |
| **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 | $190.19 | 1 | $190.19 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666133X - Forest Stand Improvement to rehabilitate degraded hardwood stands

**Scenario** #1 - FSI-structure/composition in hardwoods

**Scenario Description:**

Mixed species hardwood stands have been subjected 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). A professional forester is needed to recognize and mark crop trees to be retained and delineate areas without crop trees to be clearcut. Thinning and forest stand improvement will include cutting with hand tools (chainsaws) and injection. Costs involved in any commercial harvesting including marking, access, and transportation are not included in this scenario. However the costs involved in marking trees to be treated or left and supervising the TSI work is included.

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $5,593.12

**Scenario Cost/Unit:** $559.31

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 16 | $77.28 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| 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. | Hour | $71.74 | 40 | $2,869.60 |
| All terrain vehicles, ATV | 965 | Includes equipment, power unit and labor costs. | Hour | $31.26 | 16 | $500.16 |
| **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. | Hour | $24.81 | 16 | $396.96 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| **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. | Acre | $6.96 | 10 | $69.60 |
| Herbicide, Triazine | 1321 | Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acre | $41.65 | 10 | $416.50 |
| **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 | $190.19 | 2 | $380.38 |

**Practice:** E666133Z1 - Creating structural diversity with patch openings

**Scenario** #1 - Structural diversity with patch openings

**Scenario Description:**

Forest stand improvement that creates patch openings. Size and shape of patches will be based on characteristic natural wind disturbances, which will vary geographically and by forest type.

**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::** Acre

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $7,936.50

**Scenario Cost/Unit:** $529.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 150 | $724.50 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 15 | $361.20 |
| **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. | Hour | $24.81 | 150 | $3,721.50 |
| 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. | Hour | $104.31 | 30 | $3,129.30 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666134Z - Enhance development of the forest understory to create conditions resistant to pests

**Scenario** #1 - Forest understory-resistant to pests

**Scenario Description:**

Forest stand improvement that manages the structure and composition of overstory and understory vegetation to reduce vulnerability to damage by insects and diseases of forest trees. Managing the understory vegetation will also reduce the risk of wildfire, and promote development of herbaceous plants that benefit wildlife.

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,765.44

**Scenario Cost/Unit:** $238.27

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. | Hour | $84.38 | 16 | $1,350.08 |
| 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. | Hour | $71.74 | 16 | $1,147.84 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **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. | Acre | $37.13 | 20 | $742.60 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666135Z1 - Reduce height of the forest understory to limit wildfire risk

**Scenario** #1 - Forest understory-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.

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,765.44

**Scenario Cost/Unit:** $238.27

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. | Hour | $84.38 | 16 | $1,350.08 |
| 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. | Hour | $71.74 | 16 | $1,147.84 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **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. | Acre | $37.13 | 20 | $742.60 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666135Z2 - Reduce forest density and manage understory along roads to limit wildfire risk

**Scenario** #1 - Manage understory-limit wildfire risk

**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. Additionally, opening the canopy will allow more sunlight to reach the forest floor and promote flowering plants, and will reduce maintenance needs by allowing moisture to evaporate from roads.

**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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,893.30

**Scenario Cost/Unit:** $289.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 8 | $38.64 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | $84.38 | 8 | $675.04 |
| 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. | Hour | $71.74 | 8 | $573.92 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| **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. | Acre | $37.13 | 10 | $371.30 |

**Practice:** E666136Z1 - Reduce forest density and manage understory along roads to improve wildlife food sources

**Scenario** #1 - Manage understory-wildlife food sources

**Scenario Description:**

Opening the tree canopy along roads ("daylighting") allows more sunlight to reach the forest floor and promotes the growth of herbaceous plants. The resulting condition is more visually appealing for users of the roadway, and improves wildlife habitat and food sources for many 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,893.30

**Scenario Cost/Unit:** $289.33

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 8 | $38.64 |
| Mechanical cutter, chopper | 943 | Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | $84.38 | 8 | $675.04 |
| 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. | Hour | $71.74 | 8 | $573.92 |
| **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. | Hour | $24.81 | 8 | $198.48 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 8 | $201.44 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| **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. | Acre | $37.13 | 10 | $371.30 |

**Practice:** E666136Z2 - Reduce forest stand density to improve wildlife food sources

**Scenario** #1 - Stand density-wildlife food sources

**Scenario Description:**

Open pine or conifer management reduces the number of trees per acre while still maintaining the stand as forest land. It restores elements of wildlife habitat that formerly resulted from fire, on sites where it is not currently feasible to conduct prescribed burning. The open stand condition allows a significant amount of sunlight to reach the forest floor and stimulate understory vegetation. The initial treatment creates a stand structure that allows prescribed burning to be applied, where feasible, to limit redevelopment of the woody component of the understory and maintain open conditions. The vegetation management, and wide spacing between trees or clumps of trees, provides visual appeal, reduces the risk of wildfire, and provides wildlife habitat for many at-risk and listed 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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $5,680.83

**Scenario Cost/Unit:** $284.04

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. | Hour | $84.38 | 20 | $1,687.60 |
| 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. | Hour | $71.74 | 20 | $1,434.80 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 20 | $503.60 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **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. | Acre | $37.13 | 20 | $742.60 |
| **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 | $190.19 | 1 | $190.19 |

**Practice:** E666136Z3 - Create patch openings to enhance wildlife food sources and availability

**Scenario** #1 - Patch openings-food and availability

**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. The treatment will create diversity in stand composition and structure, and enhance wildlife food availability.

**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::** Acre

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $8,224.06

**Scenario Cost/Unit:** $548.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 150 | $724.50 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 15 | $361.20 |
| **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. | Hour | $24.81 | 150 | $3,721.50 |
| 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. | Hour | $104.31 | 30 | $3,129.30 |
| 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 t | Hour | $71.89 | 4 | $287.56 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666137Z1 - Snags, den trees, and coarse woody debris for wildlife habitat

**Scenario** #1 - Snags and den trees for wildlife

**Scenario Description:**

Create and retain 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $600.28

**Scenario Cost/Unit:** $60.03

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 7 | $33.81 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 1 | $24.08 |
| 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. | Hour | $71.74 | 3 | $215.22 |
| **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. | Hour | $44.32 | 7 | $310.24 |
| **Materials** | | | | | | |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acre | $16.93 | 1 | $16.93 |

## USDA - Natural Resources Conservation Service

**New York**

**Practice:** E666137Z2 - Summer roosting habitat for native forest-dwelling bat species

**Scenario** #1 - Summer roosting habitat for bats

**Scenario Description:**

Creates 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::** Acre

**Scenario Typical Size:** 10.0

**Scenario Total Cost:** $2,118.56

**Scenario Cost/Unit:** $211.86

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 13 | $62.79 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 6 | $144.48 |
| 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. | Hour | $71.74 | 13 | $932.62 |
| **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. | Hour | $24.81 | 13 | $322.53 |
| Specialist Labor | 235 | Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services. | Hour | $104.31 | 4 | $417.24 |
| **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. | Acre | $6.96 | 10 | $69.60 |
| Herbicide, Picloram | 337 | Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acre | $16.93 | 10 | $169.30 |

**Practice:** E666137Z3 - Increase diversity in pine plantation monocultures

**Scenario** #1 - Improve pine plantation diversity

**Scenario Description:**

Creates small openings to provide diversity in pine plantations, which are typically monocultures and inhospitable to wildlife. Small openings are one-half (0.5) to three (3) acres in size. The cleared area will have the vegetation removed through harvesting, mulching, or other means compatible with the site.

**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::** Acre

**Scenario Typical Size:** 2.0

**Scenario Total Cost:** $1,058.20

**Scenario Cost/Unit:** $529.10

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 20 | $96.60 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 2 | $48.16 |
| **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. | Hour | $24.81 | 20 | $496.20 |
| 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. | Hour | $104.31 | 4 | $417.24 |

**Practice:** E666137Z6 - Create patch openings to enhance wildlife cover and shelter

**Scenario** #1 - Patch openings-cover and shelter

**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. The treatment will create diversity in stand composition and structure, and enhance the availability of wildlife food and cover.

**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::** Acre

**Scenario Typical Size:** 15.0

**Scenario Total Cost:** $8,224.06

**Scenario Cost/Unit:** $548.27

Cost Details:

| Component Name | ID | Description | Unit | Cost | QTY | Total |
|---|---|---|---|---|---|---|
| **Equipment Installation** | | | | | | |
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | $4.83 | 150 | $724.50 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | $24.08 | 15 | $361.20 |
| **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. | Hour | $24.81 | 150 | $3,721.50 |
| 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. | Hour | $104.31 | 30 | $3,129.30 |
| 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 t | Hour | $71.89 | 4 | $287.56 |

**Practice:** E666137Z7 - Enhance development of the forest understory to provide wildlife cover and shelter

**Scenario** #1 - Understory to provide cover/shelter

**Scenario Description:**

Forest stand improvement that manages the structure and composition of overstory and understory vegetation to improve the quantity and quality of wildlife cover and shelter. Reducing the number of trees per acre provides canopy openings that allow sunlight to reach the forest floor and promote the growth of herbaceous plants, improving wildlife shelter and cover in the forest understory. The treatment also creates conditions that facilitate the use of prescribed burning as a follow-up practice to maintain wildlife shelter and cover.

**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::** Acre

**Scenario Typical Size:** 20.0

**Scenario Total Cost:** $4,955.63

**Scenario Cost/Unit:** $247.78

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. | Hour | $84.38 | 16 | $1,350.08 |
| 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. | Hour | $71.74 | 16 | $1,147.84 |
| **Labor** | | | | | | |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators ??<50 HP, Trenchers <12???, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | $25.18 | 16 | $402.88 |
| 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. | Hour | $104.31 | 8 | $834.48 |
| 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 t | Hour | $71.89 | 4 | $287.56 |
| **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. | Acre | $37.13 | 20 | $742.60 |
| **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 | $190.19 | 1 | $190.19 |