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United States  
Department of  
Interior, Bureau of Land  
Management; and  
University of Nevada  
Agricultural  
Experiment Station

# **Soil Survey of Nye County, Nevada, Northwest Part Part I**



# How To Use This Soil Survey

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This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the detailed soil map units and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. Part III includes the maps.

The **detailed soil map units** follow the general information about the survey area. These map units can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, note the number of the map sheet, and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** in Part I of this survey, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

A **State Soil Geographic Database (STATSGO)** is available for this survey area. This database consists of a soils map at a scale of 1 to 250,000 and descriptions of groups of associated soils. It replaces the general soil map published in older soil surveys. The map and the database can be used for multicounty planning, and map output can be tailored for a specific use. More information about the State Soil Geographic Database for this survey area, or any portion of Nevada, is available at the local office of the Natural Resources Conservation Service.

Some standards or values may change as more information is collected and analyzed. Thus, as older published interpretive information becomes outdated, new interpretive data must be generated and tailored to local conditions. This information is added to the State Subset of the **Map Unit Interpretation Record (MUIR)** database as needed. Map Unit Interpretation Records are the soil survey specific data and interpretations in the state soil survey database.

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This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1993. Soil names and descriptions were approved in September, 1994. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1994. This survey was made cooperatively by the Natural Resources Conservation Service and the United States Department of Interior, Bureau of Land Management, and the University of Nevada Agricultural Experiment Station. It is part of the technical assistance furnished to the Tonopah and Pahrump Conservation Districts.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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# Foreword

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This soil survey contains information that can be used in land-planning programs in Nye County, Nevada, Northwest Part. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for building or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service of the Cooperative Extension.

Nicholas N. Pearson  
State Conservationist  
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# Soil Survey of Nye County, Nevada, Northwest Part

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By John B. Fisher, Natural Resources Conservation Service

Fieldwork by Johnathan Hardman, Thomas R. McKay, Joseph H. DuRousseau, Frank Rauchschalbe, John B. Fisher, Soil Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service,  
in cooperation with  
United States Department of Interior, Bureau of Land Management and University of  
Nevada Agricultural Experiment Station

## How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, soil scientists develop a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientists to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to

verify predictions of the kinds of soil in an area and to determine the boundaries. Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size, and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists.

For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

## General Nature of the Survey Area

This section gives general information about the survey area. It briefly discusses history; industries, transportation, and recreation; physiography, drainage, and geology; and climate.

### History

In 1827, Jedediah S. Smith, part owner of the Rocky Mountain Fur Company, crossed through the survey area to the present site of Manhattan. He was the first reported visitor into the Area. In 1846, Captain Fremont's expedition went through the southern part of the Area (7). Mexicans probably mined in the area in about 1854, and some early trappers from Canada came into the region well before 1860. The history of this region since 1862 is mainly a history of mining. Among the earliest settlements in the Area was Tybo, where a mining district was established in 1866, and Downeyville in the 1870's.

After the first discovery of gold, the mining industry was active for only a decade or two, and then it gradually declined until 1900.

Presently, mining activity is limited mostly to assessment work and exploration. Some of the mines and mining towns and all of the railroads in the survey area have been abandoned. The Gabbs area has been an area of sporadic mining throughout the twentieth century. Presently, magnesite and gold mines are active and important to the local community.

Many of the ranches have been in existence a long time. Their history and economics are related to the mining camps. Generally, the first ranches were established where there were springs, mountain streams, and wet meadows. There, farming could be combined with ranching. A number of ranches were well known as stage stations, watering sites, or camping places for freighters and other travelers.

## Industry, Transportation, and Recreation

Gabbs, in the northwest part of the area is the largest community within the survey area. Nearby Tonopah, the county seat of Nye County is also important to the area as a center of economic activity and essential services.

The main industries in the survey area are ranching, mining, and recreation.

The ranches are dominantly cow-calf operations. The calf crop is generally sold in the fall and exported. There are a few herds of sheep that graze through the survey area.

Irrigation water for native meadows, pastures, and alfalfa crops in the area is supplied by wells and streams. At the higher elevations numerous small springs, seeps, and intermittent streams provide water for livestock and wildlife. Wells and springs provide water for domestic use.

Numerous mines are in the survey area. The major minerals are gold, silver, molybdenum, and magnesite.

Outdoor enthusiasts find opportunities for recreation throughout the area. Remote back country areas are popular for hiking, horseback riding, and photography. Rock hounds and hunters also find localized recreational opportunities within the survey area. A few historic towns and mine sites, including Downeyville, Goldyke, Broken Hills and Tybo dot the area.

The main method of transportation in the survey area is by motor vehicle. The paved highways include U.S. 6, U.S. 95, and State routes 361 and 376. Many gravel and improved dirt roads provide access to the area. The Tonopah airport is located in the survey area.

## Physiography, Drainage, and Geology

The survey area is in the Great Basin section of the Basin and Range province in northwestern Nye County (3). The survey area is typified by internally drained valleys hemmed in by mountains, low foothills, and broad alluvial fans. The survey area is elongated and makes up about 1,530,766 acres (2,392 miles). It extends from Lander-Nye County line on the north to the Nellis Air Force Range to the south. The mountains have a maximum elevation of about 8,100 feet; the valley floors drop to a low elevation of about 4,500 feet.

Water from the majority of the tributaries in the soil survey area eventually ends up on bolson floors. The mostly intermittent flow of these streams is supplied by spring runoff and summer convection storms. A small portion of the survey area is drained by Reese

River which joins the Humbolt River near Battle Mountain.

The geology of the survey area is variable and complex. Most pre-Tertiary rock outcrops in the survey area are late Paleozoic and Mesozoic marine sedimentary strata interbedded with metavolcanics. Most of the Paleozoic strata is mainly carbonatic assemblage. "A volcanic-detrital assemblage with near-shore elements dominates the late Paleozoic(?) and Mesozoic sections in the extreme western part of Nye County and is possibly of island-ark or back-basin origin" according to Kleinhampl and Ziony (6). Plutonic rock outcrops are small and are pre-Cenozoic, Cretaceous and Jurassic.

Tertiary rock outcrops are mainly thick pyroclastic material in ash-flow tuff sheets of silicic to intermediate composition. Subordinate andesite to dacite lavas and intrusive and extrusive masses are intercalated with the tuff sheets near the base of the volcanic section. Mafic lavas form a thin cap on the volcanic section. Tertiary sedimentary units from deposition into small lakes are interbedded within the volcanic rocks.

The valleys are filled with Pleistocene alluvium and are covered with a mantle of Holocene sediments.

## Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Reese River O'Toole, Smoky Valley, and Tonopah. Table 2 shows probable dates of the first freeze in fall and the last freeze in the spring. Table 3 provides data on length of growing season.

Growing degree days, shown in Table 1, are equivalent to "heat units". Beginning in the spring, growing degree days accumulate by the amount the average temperature exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze of spring and the first freeze of fall.

The total annual precipitation is 7.71 inches at Reese River O'Toole located in the northern part of the survey area. The total annual precipitation is 6.71 inches at Smoky Valley, located outside the survey area but representative of the central valleys. The total precipitation is 5.29 inches at Tonopah, located outside the survey area but representative of the southern part of the area.



# Detailed Soil Map Units

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The map units on the detailed maps in Part III of this publication represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the headings "Use and Management of the Soils" and "Soil Properties."

A map unit delineation on the detailed soil maps represents an area dominated by one or more soils or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, are mapped without including areas of other taxonomic classes. Consequently, map units are made up of the soils or miscellaneous areas for which they are named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties and behavioral characteristics similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure

taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit. The principal hazards and limitations to be considered in planning for specific uses are identified in the tables and narrative in Part II.

## Kinds of Map Units

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Some of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, gravelly sandy loam, 2 to 8 percent slopes is a phase of the Unsel series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations.

A complex consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Downeyville-Goldyke-Blacktop is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Downeyville-Goldyke-Blacktop association is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rubble land is an example.

## Acreage and Extent

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

## Headings and Introductory Phases

In the map unit descriptions that follow, a semitabular format is used. In this format the major headings are centered in the column (for example, *Composition*). They identify the information grouped directly below them. Introducing each item of information under the centered heading is a term or phrase (for example, *Major Components*) that identifies or describes the information. Many of the centered headings and introductory terms are self-explanatory; however, some of them need further explanation and are defined in the Glossary. Explanations of the headings and introductory phrases are provided in the following paragraphs, generally in the order in which they are used in the map unit descriptions.

*Composition* is given for the components (soils or miscellaneous areas) identified in the name of the map unit as well as for the contrasting inclusions.

*Contrasting Inclusions* are areas of components that differ sufficiently in use and management from the soils or miscellaneous areas for which the map unit is named. As was explained earlier, inclusions can either be *similar* or *contrasting*. Note that in the *Composition* section a single percentage is provided for a named soil and its similar inclusions because their use and management are similar.

*Map Unit Setting* is given for the entire map unit. This section gives the position on the landscape. The landscape positions given for the entire map unit generally are broader than those given for each component. Below the map unit setting, the position of each component and inclusion is listed, and the physiographic location of each is identified.

*Major Component Description* lists the characteristics of the major components. These include elevation, texture of the surface layer, drainage class, parent material, and climatic data.

*Dominant Present Vegetation* lists the common plants growing on each soil at the present time. The present vegetation may be similar to the potential native plant community, but in some areas it consists of other plants, either cultivated or wild, that dominate the soils in the map unit.

*Ecological Site* is the assigned rangeland or grazed forest land ecological site that identifies a unique potential native plant community. The plant species and production typical of each ecological site are listed

by map unit in the section "Rangeland Plants and Woodland Understory." Additional information about these sites is provided under the heading "Rangeland and Grazeable Woodland Resource Management" in Part II of this publication. Further information also can be obtained from the local office of the Natural Resources Conservation Service.

## 1000--Stumble loamy sand, 2 to 8 percent slopes

### *Composition*

#### **Major Components**

Stumble loamy sand, 2 to 8 percent slopes--85 percent

#### **Contrasting Inclusions**

Inclusion 1: Koyen sandy loam, 2 to 8 percent slopes--8 percent

Inclusion 2: Typic Camborthids sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 3: Typic Torriorthents gravelly loamy sand, 2 to 8 percent slopes--2 percent

### *Map Unit Setting*

*Landscape position:* Fan piedmonts

Stumble--Landform: Inset fans

Inclusion 1--Landform: Inset fans; position on slope: upper

Inclusion 2--Landform: Inset fans; position on slope: upper

Inclusion 3--Landform: Channels

### *Major Component Description*

#### **Stumble Series**

*Elevation:* 4,800 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Water re-worked eolian sand

### *Dominant Present Vegetation*

Stumble: Indian ricegrass, littleleaf horsebrush

Inclusion 1: Galleta

Inclusion 2: Galleta

Inclusion 3: Burrobrush

### *Ecological Site*

Stumble: 029XY012NV

Inclusion 1: 029XY016NV

Inclusion 2: 029XY046NV

Inclusion 3: 029XY041NV

## 1001--Stumble-Koyen association

### *Composition*

#### **Major Components**

Stumble loamy sand, 2 to 8 percent slopes--65 percent

Koyen sand, 2 to 8 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Koyen loamy sand, 2 to 8 percent slopes--7 percent

Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Stumble--Landform: Inset fans; position on slope: upper

Koyen--Landform: Inset fans; position on slope: lower

Inclusion 1--Landform: Inset fans; position on slope: upper

Inclusion 2--Landform: Inset fans

**Major Component Description****Stumble Series**

*Elevation:* 4,900 to 6,100 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Eolian sand and mixed alluvium

**Koyen Series**

*Elevation:* 4,900 to 6,100 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Sand

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Stumble: Indian ricegrass, fourwing saltbush

Koyen: Fourwing saltbush, galleta

Inclusion 1: Fourwing saltbush, galleta, rabbitbrush, spiny hopsage

Inclusion 2: Burrobrush

**Ecological Site**

Stumble: 029XY012NV

Koyen: 029XY046NV

Inclusion 1: 029XY06NV

Inclusion 2: 029XY041NV

**1004--Stumble-Eastgate association****Composition****Major Components**

Stumble loamy sand, 2 to 8 percent slopes--50 percent

Eastgate gravelly loamy sand, 2 to 4 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torripsamments, mixed, mesic loamy sand, 2 to 8 percent slopes--7 percent

Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes--4 percent

Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly loamy sand, 2 to 8 percent slopes--4 percent

**Map Unit Setting**

*Landscape position:* Bolsons

Stumble--Landform: Inset fans

Eastgate--Landform: Fan skirts

Inclusion 1--Landform: Inset fans; position on slope: lower

Inclusion 2--Landform: Channels; position on slope: lower

Inclusion 3--Landform: Channels

**Major Component Description****Stumble Series**

*Elevation:* 4,800 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Eolian sand and mixed alluvium

**Eastgate Series**

*Elevation:* 4,800 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 20 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Well drained

*Dominant parent material:* Eolian sand and mixed alluvium

**Dominant Present Vegetation**

Stumble: Indian ricegrass, littleleaf horsebrush

Eastgate: Fourwing saltbush, galleta, spiny hopsage

Inclusion 1: Indian ricegrass, Wyoming big sagebrush

Inclusion 2: Burrobrush

Inclusion 3: Wyoming big sagebrush, Wyoming big sagebrush, rubber rabbitbrush

**Ecological Site**

Stumble: 029XY012NV

Eastgate: 029XY046NV

Inclusion 1: 028BY005NV

Inclusion 2: 029XY041NV

Inclusion 3: 029XY009NV

**1005--Stumble-Unsel-Eastgate association****Composition****Major Components**

Stumble loamy sand, 2 to 8 percent slopes--40 percent

Unsel gravelly sandy loam, 2 to 8 percent slopes--25 percent

Eastgate gravelly loamy sand, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

- Inclusion 1: Typic Torriorthents, sandy-skeletal, mixed, mesic gravelly sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 2: Isolde fine sand, 2 to 15 percent slopes, moist--5 percent  
 Inclusion 3: Typic Torriorthents stony loamy sand, 2 to 8 percent slopes--5 percent

**Map Unit Setting**

- Landscape position:* Fan piedmonts  
 Stumble--Landform: Inset fans; position on slope: upper  
 Unsel--Landform: Fan remnants  
 Eastgate--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: lower  
 Inclusion 2--Landform: Dunes  
 Inclusion 3--Landform: Channels

**Major Component Description****Stumble Series**

- Elevation:* 4,000 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Unsel Series**

- Elevation:* 4,000 to 5,500 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Eastgate Series**

- Elevation:* 4,000 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

- Stumble: Indian ricegrass  
 Unsel: Bailey greasewood, galleta, shadscale  
 Eastgate: Galleta  
 Inclusion 1: Spiny hopsage  
 Inclusion 2: Indian ricegrass  
 Inclusion 3: Burrobrush

**Ecological Site**

- Stumble: 029XY012NV  
 Unsel: 029XY087NV  
 Eastgate: 029XY046NV  
 Inclusion 1: 029XY016NV  
 Inclusion 2: 027XY023NV  
 Inclusion 3: 029XY041NV

**1021--Easychair-Penoyer association****Composition****Major Components**

- Easychair silt loam, 0 to 4 percent slopes--45 percent  
 Penoyer silt loam, 0 to 2 percent slopes--40 percent

**Contrasting Inclusions**

- Inclusion 1: Geer fine sandy loam, 0 to 4 percent slopes--6 percent  
 Inclusion 2: Koyen gravelly sandy loam, 0 to 4 percent slopes--6 percent  
 Inclusion 3: Sevenmile sandy loam, 0 to 4 percent slopes--3 percent

**Map Unit Setting**

- Landscape position:* Fan piedmonts  
 Easychair--Landform: Inset fans; position on slope: lower  
 Penoyer--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: upper  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Inset fans; position on slope: lower

**Major Component Description****Easychair Series**

- Elevation:* 5,800 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 55 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Penoyer Series**

- Elevation:* 5,800 to 6,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

- Easychair: Fourwing saltbush  
 Penoyer: Indian ricegrass, winterfat  
 Inclusion 1: Indian ricegrass, bud sagebrush, winterfat  
 Inclusion 2: Fourwing saltbush

Inclusion 3: Wyoming big sagebrush

**Ecological Site**

Easychair: 029XY048NV  
 Penoyer: 029XY020NV  
 Inclusion 1: 029XY042NV  
 Inclusion 2: 029XY046NV  
 Inclusion 3: 029XY114NV

**1031--Eastgate gravelly sandy loam, 0 to 4 percent slopes**

**Composition**

**Major Components**

Eastgate gravelly sandy loam, 0 to 4 percent slopes--90 percent

**Contrasting Inclusions**

Inclusion 1: Typic Natrargids, fine-loamy, mixed, mesic loamy fine sand, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Typic Haplargids, fine-loamy, mixed, mesic very gravelly fine sandy loam, 2 to 4 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Bolsons  
 Eastgate--Landform: Fan skirts  
 Inclusion 1--Landform: Alluvial flats  
 Inclusion 2--Landform: Fan piedmonts

**Major Component Description**

**Eastgate Series**

*Elevation:* 5,300 to 5,800 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Dominant Present Vegetation**

Eastgate: Fourwing saltbush, galleta, spiny hopsage  
 Inclusion 1: Black greasewood  
 Inclusion 2: Bailey greasewood, shadscale

**Ecological Site**

Eastgate: 029XY046NV  
 Inclusion 1: 027XY025NV  
 Inclusion 2: 027XY043NV

**1035--Eastgate-Lyx-Stumble association**

**Composition**

**Major Components**

Eastgate loamy sand, 0 to 8 percent slopes--40 percent  
 Lyx gravelly loamy sand, 2 to 8 percent slopes--35 percent  
 Stumble loamy sand, 0 to 4 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Unsel gravelly loamy sand, 2 to 8 percent slopes--3 percent  
 Inclusion 2: Stargo loamy sand, 0 to 2 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Bolsons  
 Eastgate--Landform: Inset fans; position on slope: upper  
 Lyx--Landform: Inset fans; position on slope: lower  
 Stumble--Landform: Inset fans  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Fan skirts; position on slope: lower

**Major Component Description**

**Eastgate Series**

*Elevation:* 4,800 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Lyx Series**

*Elevation:* 4,800 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

**Stumble Series**

*Elevation:* 4,800 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Dominant Present Vegetation**

Eastgate: Galleta  
 Lyx: Galleta  
 Stumble: Indian ricegrass  
 Inclusion 1: Bud sagebrush, galleta, shadscale  
 Inclusion 2: Bud sagebrush, shadscale

**Ecological Site**

Eastgate: 029XY046NV  
 Lyx: 029XY046NV  
 Stumble: 029XY012NV  
 Inclusion 1: 029XY017NV  
 Inclusion 2: 029XY017NV

**1039--Eastgate-Lyx association****Composition****Major Components**

Eastgate loamy sand, 0 to 2 percent slopes--50 percent  
Lyx very gravelly loamy sand, 0 to 2 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Geer fine sandy loam, 0 to 2 percent slopes--6 percent  
Inclusion 2: Typic Torrifluvents, fine-silty, mixed (calcareous), mesic sandy loam, 0 to 2 percent slopes--4 percent

**Map Unit Setting**

*Landscape position:* Bolsons  
Eastgate--Landform: Fan skirts  
Lyx--Landform: Fan skirts; position on slope: lower  
Inclusion 1--Landform: Inset fans; position on slope: lower  
Inclusion 2--Landform: Channels

**Major Component Description****Eastgate Series**

*Elevation:* 5,400 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Lyx Series**

*Elevation:* 5,400 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Eastgate: Fourwing saltbush, galleta, spiny hopsage  
Lyx: Fourwing saltbush, galleta, spiny hopsage  
Inclusion 1: Indian ricegrass, fourwing saltbush, galleta, shadscale, winterfat  
Inclusion 2: Black greasewood, shadscale

**Ecological Site**

Eastgate: 029XY046NV  
Lyx: 029XY046NV  
Inclusion 1: 029XY042NV  
Inclusion 2: 029XY018NV

**1050--Schwalbe-Stewval-Bellehelen association****Composition****Major Components**

Schwalbe very stony fine sandy loam, 15 to 75 percent slopes--35 percent  
Stewval very gravelly fine sandy loam, 15 to 75 percent slopes--30 percent  
Bellehelen very stony loam, 15 to 75 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--7 percent  
Inclusion 2: Aridic Haploxerolls, loamy-skeletal, mixed, frigid very stony sandy loam, 15 to 50 percent slopes--5 percent  
Inclusion 3: Gabbvally very stony sandy loam, 15 to 50 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Hills  
Schwalbe--Landform: Hills; geomorphic position: backslope  
Stewval--Landform: Hills; geomorphic position: backslope; aspect: south  
Bellehelen--Landform: Mountains; geomorphic position: backslope; aspect: northeast  
Inclusion 1--Landform: Hills  
Inclusion 2--Landform: Hills; geomorphic position: backslope; position on slope: upper; aspect: north  
Inclusion 3--Landform: Hills; geomorphic position: backslope

**Major Component Description****Schwalbe Series**

*Elevation:* 7,000 to 8,000 feet  
*Precipitation:* About 11 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 15 percent cobbles; 30 percent gravel  
*Surface layer texture:* Very stony fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Stewval Series**

*Elevation:* 6,800 to 8,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Bellehelen Series**

*Elevation:* 7,000 to 8,800 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 47 degrees

*Frost-free season:* About 100 days  
*Surface rock fragments:* 25 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Schwalbe: Indian ricegrass, Thurber needlegrass, Wyoming big sagebrush, mountain big sagebrush  
 Stewval: Black sagebrush, galleta  
 Bellehelen: Utah juniper, singleleaf pinyon  
 Inclusion 1: None  
 Inclusion 2: Mountain big sagebrush, muttongrass, singleleaf pinyon  
 Inclusion 3: Wyoming big sagebrush

#### ***Ecological Site***

Schwalbe: 029XY106NV  
 Stewval: 029XY008NV  
 Bellehelen: 029XY069NV  
 Inclusion 1: none  
 Inclusion 2: 029XY103NV  
 Inclusion 3: 029XY010NV

### **1060--Celeton-Badland association**

#### ***Composition***

**Major Components**  
 Celeton very gravelly loam, 8 to 15 percent slopes--40 percent  
 Celeton very cobbly sandy loam, 15 to 50 percent slopes--30 percent  
 Badland weathered bedrock, 8 to 75 percent slopes--20 percent  
**Contrasting Inclusions**  
 Inclusion 1: Typic Torriorthents, sandy, mixed, mesic loamy sand, 4 to 15 percent slopes--4 percent  
 Inclusion 2: Vigus gravelly loamy sand, 2 to 4 percent slopes--3 percent  
 Inclusion 3: Terlco very cobbly fine sandy loam, 4 to 8 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Celeton--Landform: Hills  
 Celeton--Landform: Hills  
 Badland--Landform: Hills  
 Inclusion 1--Landform: Drainageways  
 Inclusion 2--Landform: Fan remnants  
 Inclusion 3--Landform: Fan remnants

#### ***Major Component Description***

**Celeton Series**  
*Elevation:* 4,600 to 5,500 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from diatomaceous earth

#### **Celeton Series**

*Elevation:* 4,600 to 5,500 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent cobbles; 30 percent gravel  
*Surface layer texture:* Very cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from diatomaceous earth

#### **Badland Miscellaneous Area**

*Elevation:* 4,600 to 5,500 feet  
*Surface layer texture:* Weathered bedrock

#### ***Dominant Present Vegetation***

Celeton: Shadscale  
 Celeton: Shadscale  
 Badland: None  
 Inclusion 1: Indian ricegrass, fourwing saltbush  
 Inclusion 2: Bailey greasewood, shadscale  
 Inclusion 3: Bailey greasewood, shadscale

#### ***Ecological Site***

Celeton: 027XY027NV  
 Celeton: 027XY027NV  
 Badland: None  
 Inclusion 1: 027XY009NV  
 Inclusion 2: 029XY087NV  
 Inclusion 3: 029XY087NV

### **1061--Celeton-Vigus-Whirlo association**

#### ***Composition***

**Major Components**  
 Celeton very gravelly loam, 4 to 15 percent slopes--35 percent  
 Vigus gravelly loamy sand, 2 to 4 percent slopes--35 percent  
 Whirlo gravelly sandy loam, 4 to 8 percent slopes--20 percent  
**Contrasting Inclusions**  
 Inclusion 1: Badland--5 percent  
 Inclusion 2: Terlco very cobbly fine sandy loam, 4 to 8 percent slopes, dry--5 percent

#### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Celeton--Landform: Hills  
 Vigus--Landform: Fan remnants  
 Whirlo--Landform: Inset fans  
 Inclusion 1--Landform: Hills

Inclusion 2--Landform: Fan remnants; position on slope: lower

### ***Major Component Description***

#### **Celeton Series**

*Elevation:* 4,600 to 5,500 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 50 percent gravel

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from diatomaceous earth

#### **Vigus Series**

*Elevation:* 4,600 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Whirlo Series**

*Elevation:* 4,600 to 5,500 feet

*Precipitation:* About 7 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 30 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Celeton: Shadscale

Vigus: Bailey greasewood, shadscale

Whirlo: Shadscale

Inclusion 1: None

Inclusion 2: Bailey greasewood, shadscale

### ***Ecological Site***

Celeton: 027XY027NV

Vigus: 029XY087NV

Whirlo: 027XY013NV

Inclusion 1: none

Inclusion 2: 029XY087NV

## **1071--Singatse-Theon-Rock outcrop association**

### ***Composition***

#### **Major Components**

Singatse very stony sandy loam, 8 to 30 percent slopes--40 percent

Theon very gravelly sandy loam, 8 to 30 percent slopes--35 percent

Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Annaw very gravelly loamy sand, 2 to 8 percent slopes--5 percent

Inclusion 2: Goldyke gravelly sandy loam, 4 to 15 percent slopes, dry--5 percent

### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins

Singatse--Landform: Hills

Theon--Landform: Hills; aspect: north

Rock outcrop--Landform: Ridges

Inclusion 1--Landform: Fan piedmonts

Inclusion 2--Landform: Hills; geomorphic position: toeslope

### ***Major Component Description***

#### **Singatse Series**

*Elevation:* 4,800 to 5,400 feet

*Precipitation:* About 5 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 20 percent cobbles; 25 percent gravel

*Surface layer texture:* Very stony sandy loam

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Theon Series**

*Elevation:* 4,800 to 5,400 feet

*Precipitation:* About 5 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 10 percent cobbles; 40 percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 4,800 to 5,400 feet

*Surface layer texture:* Unweathered bedrock

### ***Dominant Present Vegetation***

Singatse: Bud sagebrush, shadscale

Theon: Shadscale

Rock outcrop: None

Inclusion 1: Bailey greasewood, spiny menodora

Inclusion 2: Bailey greasewood, galleta, shadscale

### ***Ecological Site***

Singatse: 027XY027NV

Theon: 027XY019NV

Rock outcrop: None

Inclusion 1: 029XY036NV

Inclusion 2: 029XY022NV

**1076--Singatse-Hawsley association****Composition****Major Components**

Singatse very stony sandy loam, 8 to 50 percent slopes--45 percent

Hawsley loamy sand, 8 to 15 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--10 percent

Inclusion 2: Isolde fine sand, 4 to 15 percent slopes, moist--5 percent

**Map Unit Setting**

*Landscape position:* Hills

Singatse--Landform: Hills

Hawsley--Landform: Sand sheets

Inclusion 1--Landform: Ridges

Inclusion 2--Landform: Dunes

**Major Component Description****Singatse Series**

*Elevation:* 4,800 to 5,400 feet

*Precipitation:* About 5 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 20 percent cobbles; 25 percent gravel

*Surface layer texture:* Very stony sandy loam

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Hawsley Series**

*Elevation:* 4,800 to 5,400 feet

*Precipitation:* About 6 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Eolian sand and mixed alluvium

**Dominant Present Vegetation**

Singatse: Bailey greasewood, shadscale

Hawsley: Bailey greasewood, Indian ricegrass

Inclusion 1: None

Inclusion 2: Indian ricegrass, hairy horsebrush

**Ecological Site**

Singatse: 027XY027NV

Hawsley: 027XY009NV

Inclusion 1: none

Inclusion 2: 027XY023NV

**1090--Univega-Koyen-Watoopah association****Composition****Major Components**

Univega gravelly fine sand, 2 to 8 percent slopes--50 percent

Koyen sandy loam, 2 to 4 percent slopes--25 percent

Watoopah gravelly loamy sand, 2 to 8 percent slopes--10 percent

**Contrasting Inclusions**

Inclusion 1: Unsel gravelly fine sandy loam, 2 to 8 percent slopes--6 percent

Inclusion 2: Jevets sand, 2 to 8 percent slopes--5 percent

Inclusion 3: Zadvar gravelly sandy loam, 2 to 8 percent slopes--4 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Univega--Landform: Fan remnants

Koyen--Landform: Inset fans

Watoopah--Landform: Fan remnants; position on slope: upper

Inclusion 1--Landform: Fan remnants; position on slope: lower

Inclusion 2--Landform: Fan remnants; position on slope: lower

Inclusion 3--Landform: Fan remnants; position on slope: upper

**Major Component Description****Univega Series**

*Elevation:* 5,800 to 6,400 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly fine sand

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Koyen Series**

*Elevation:* 5,800 to 6,400 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Watoopah Series**

*Elevation:* 5,800 to 6,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 35 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Dominant Present Vegetation**

Univega: Douglas rabbitbrush, bottlebrush squirreltail, fourwing saltbush, galleta, littleleaf horsebrush  
 Koyen: Bud sagebrush, fourwing saltbush, galleta  
 Watoopah: Wyoming big sagebrush, bottlebrush squirreltail, spiny hopsage  
 Inclusion 1: Bud sagebrush, galleta, shadscale  
 Inclusion 2: Indian ricegrass  
 Inclusion 3: Black sagebrush, galleta

#### **Ecological Site**

Univega: 029XY046NV  
 Koyen: 029XY046NV  
 Watoopah: 029XY049NV  
 Inclusion 1: 029XY017NV  
 Inclusion 2: 029XY012NV  
 Inclusion 3: 029XY008NV

### **1092--Univega gravelly fine sand, 2 to 8 percent slopes**

#### **Composition**

##### **Major Components**

Univega gravelly fine sand, 2 to 8 percent slopes--85 percent

##### **Contrasting Inclusions**

Inclusion 1: Typic Calciorthids, coarse-loamy, mixed, mesic gravelly sand, 2 to 8 percent slopes--10 percent  
 Inclusion 2: Stumble loamy sand, 0 to 2 percent slopes--3 percent  
 Inclusion 3: Typic Torriorthents, sandy, mixed, mesic loamy sand, 2 to 4 percent slopes--2 percent

#### **Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Univega--Landform: Fan remnants  
 Inclusion 1--Landform: Fan remnants; position on slope: lower  
 Inclusion 2--Landform: Sand sheets  
 Inclusion 3--Landform: Inset fans

#### **Major Component Description**

##### **Univega Series**

*Elevation:* 5,800 to 6,200 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Dominant Present Vegetation**

Univega: Douglas rabbitbrush, bottlebrush squirreltail, fourwing saltbush, galleta, littleleaf horsebrush

Inclusion 1: Douglas rabbitbrush, bottlebrush squirreltail, galleta

Inclusion 2: Douglas rabbitbrush, Indian ricegrass

Inclusion 3: Indian ricegrass, Wyoming big sagebrush, rubber rabbitbrush

#### **Ecological Site**

Univega: 029XY046NV  
 Inclusion 1: 029XY046NV  
 Inclusion 2: 029XY012NV  
 Inclusion 3: 029XY009NV

### **1093--Univega-Jevets association**

#### **Composition**

##### **Major Components**

Univega gravelly sandy loam, 4 to 15 percent slopes--35 percent

Jevets fine sand, 4 to 15 percent slopes--30 percent

Univega gravelly sandy loam, 4 to 15 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Stumble sand, 2 to 15 percent slopes--8 percent

Inclusion 2: Koyen sand, 2 to 8 percent slopes--5 percent

Inclusion 3: Izo very gravelly loamy sand, 2 to 8 percent slopes--2 percent

#### **Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Univega--Landform: Fan remnants  
 Jevets--Landform: Fan remnants  
 Univega--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Channels

#### **Major Component Description**

##### **Univega Series**

*Elevation:* 5,000 to 5,800 feet  
*Precipitation:* About 8 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Jevets Series**

*Elevation:* 5,000 to 5,800 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sand  
*Drainage class:* Well drained

*Dominant parent material:* Eolian sand and mixed alluvium

**Univega Series**

*Elevation:* 5,000 to 5,800 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Univega: Galleta, spiny hopsage  
 Jevets: Indian ricegrass, fourwing saltbush  
 Univega: Fourwing saltbush, galleta  
 Inclusion 1: Indian ricegrass, fourwing saltbush  
 Inclusion 2: Fourwing saltbush, galleta  
 Inclusion 3: Burrobrush

***Ecological Site***

Univega: 029XY016NV  
 Jevets: 029XY012NV  
 Univega: 029XY046NV  
 Inclusion 1: 029XY012NV  
 Inclusion 2: 029XY046NV  
 Inclusion 3: 029XY041NV

**1100--Gabbvally-Stewval association**

***Composition***

**Major Components**

Gabbvally very gravelly sandy loam, 8 to 50 percent slopes--45 percent  
 Stewval very gravelly fine sandy loam, 8 to 50 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--5 percent  
 Inclusion 2: Beelem extremely cobbly sandy loam, 8 to 50 percent slopes--5 percent  
 Inclusion 3: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic very gravelly sandy loam, 2 to 15 percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Hills  
 Gabbvally--Landform: Hills; aspect: north  
 Stewval--Landform: Hills  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Hills; geomorphic position: backslope  
 Inclusion 3--Landform: Drainageways

***Major Component Description***

**Gabbvally Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Stewval Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

***Dominant Present Vegetation***

Gabbvally: Wyoming big sagebrush, galleta  
 Stewval: Black sagebrush, galleta  
 Inclusion 1: None  
 Inclusion 2: Utah juniper  
 Inclusion 3: Wyoming big sagebrush

***Ecological Site***

Gabbvally: 029XY010NV  
 Stewval: 029XY008NV  
 Inclusion 1: none  
 Inclusion 2: 029XY081NV  
 Inclusion 3: 029XY009NV

**1130--Unsel gravelly sandy loam, 2 to 8 percent slopes**

***Composition***

**Major Components**

Unsel gravelly sandy loam, 2 to 8 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Lyx very gravelly loamy sand, 2 to 8 percent slopes--8 percent  
 Inclusion 2: Typic Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--3 percent  
 Inclusion 3: Koyen very gravelly loamy sand, 2 to 4 percent slopes--4 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants  
 Inclusion 1--Landform: Inset fans; position on slope: lower  
 Inclusion 2--Landform: Channels  
 Inclusion 3--Landform: Inset fans

**Major Component Description****Unsel Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Unsel: Bud sagebrush, galleta, shadscale  
 Inclusion 1: Galleta  
 Inclusion 2: Burrobrush  
 Inclusion 3: Galleta

**Ecological Site**

Unsel: 029XY017NV  
 Inclusion 1: 029XY046NV  
 Inclusion 2: 029XY041NV  
 Inclusion 3: 029XY046NV

**1131--Unsel-Geer association****Composition****Major Components**

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--70 percent  
 Geer fine sandy loam, 0 to 4 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Koyen gravelly loamy sand, 2 to 4 percent slopes--4 percent  
 Inclusion 2: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic gravelly loamy sand, 2 to 4 percent slopes--4 percent  
 Inclusion 3: Stargo gravelly sandy loam, 0 to 2 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Bolsons  
 Unsel--Landform: Fan remnants  
 Geer--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: upper  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Fan skirts; position on slope: upper

**Major Component Description****Unsel Series**

*Elevation:* 5,200 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Geer Series**

*Elevation:* 5,200 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Unsel: Bud sagebrush, galleta, shadscale  
 Geer: Indian ricegrass, winterfat  
 Inclusion 1: Galleta  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Bud sagebrush, shadscale

**Ecological Site**

Unsel: 029XY017NV  
 Geer: 029XY042NV  
 Inclusion 1: 029XY046NV  
 Inclusion 2: 029XY006NV  
 Inclusion 3: 029XY017NV

**1132--Unsel-Hollywell-Roic association****Composition****Major Components**

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--35 percent  
 Hollywell very gravelly loamy sand, 2 to 15 percent slopes--25 percent  
 Roic gravelly sandy loam, 4 to 30 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Lithic Haplargids, loamy-skeletal, mixed, mesic very cobbly sandy loam, 4 to 30 percent slopes--6 percent  
 Inclusion 2: Roic gravelly loam, 15 to 50 percent slopes, dry--4 percent  
 Inclusion 3: Izo extremely gravelly loamy sand, 2 to 8 percent slopes--4 percent  
 Inclusion 4: Stewval very cobbly sandy loam, 15 to 50 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Unsel--Landform: Fan remnants  
 Hollywell--Landform: Inset fans  
 Roic--Landform: Pediments  
 Inclusion 1--Landform: Hills  
 Inclusion 2--Landform: Hills  
 Inclusion 3--Landform: Inset fans  
 Inclusion 4--Landform: Hills; aspect: north

**Major Component Description**

**Unsel Series**

*Elevation:* 5,000 to 5,500 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Hollywell Series**

*Elevation:* 5,000 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 55 percent gravel  
*Surface layer texture:* Very gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Roic Series**

*Elevation:* 5,000 to 5,500 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 45 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Dominant Present Vegetation**

Unsel: Bailey greasewood, Nevada ephedra, bud sagebrush, galleta, shadscale  
 Hollywell: Bailey greasewood, Nevada ephedra, bud sagebrush, shadscale  
 Roic: Bailey greasewood, shadscale  
 Inclusion 1: Bailey greasewood, Nevada ephedra, shadscale  
 Inclusion 2: Bailey greasewood, Indian ricegrass, bud sagebrush, shadscale  
 Inclusion 3: Burrobrush  
 Inclusion 4: Black sagebrush, galleta

**Ecological Site**

Unsel: 029XY087NV  
 Hollywell: 029XY087NV  
 Roic: 029XY022NV  
 Inclusion 1: 029XY087NV  
 Inclusion 2: 029XY033NV  
 Inclusion 3: 029XY041NV  
 Inclusion 4: 029XY008NV

**1133--Unsel, moist-Geer association**

**Composition**

**Major Components**

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--70 percent  
 Geer fine sandy loam, 0 to 4 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic very gravelly sandy loam, 8 to 30 percent slopes--8 percent  
 Inclusion 2: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic gravelly loam, 15 to 50 percent slopes--3 percent  
 Inclusion 3: Leo very gravelly sandy loam, 2 to 8 percent slopes--2 percent  
 Inclusion 4: Izo very gravelly loamy sand, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants  
 Geer--Landform: Inset fans  
 Inclusion 1--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 2--Landform: Pediments  
 Inclusion 3--Landform: Inset fans; position on slope: upper  
 Inclusion 4--Landform: Channels

**Major Component Description**

**Unsel Series**

*Elevation:* 5,300 to 6,500 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Geer Series**

*Elevation:* 5,200 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Unsel: Bailey greasewood, Indian ricegrass, bud sagebrush, galleta, shadscale  
 Geer: Indian ricegrass, winterfat  
 Inclusion 1: Bailey greasewood, Indian ricegrass, shadscale  
 Inclusion 2: Black sagebrush, galleta

Inclusion 3: Bailey greasewood, Indian ricegrass, spiny hopsage  
 Inclusion 4: Burrobrush

### ***Ecological Site***

Unsel: 029XY087NV  
 Geer: 029XY042NV  
 Inclusion 1: 029XY087NV  
 Inclusion 2: 029XY014NV  
 Inclusion 3: 029XY016NV  
 Inclusion 4: 029XY041NV

## **1134--Unsel-Hollywell-Lyx association**

### ***Composition***

#### **Major Components**

Unsel gravelly fine sandy loam, 4 to 8 percent slopes--40 percent  
 Hollywell gravelly loamy sand, 4 to 8 percent slopes--25 percent  
 Lyx gravelly loamy sand, 4 to 8 percent slopes--25 percent

#### **Contrasting Inclusions**

Inclusion 1: Veet very gravelly sandy loam, 2 to 8 percent slopes--4 percent  
 Inclusion 2: Typic Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--3 percent  
 Inclusion 3: Geer fine sandy loam, 0 to 4 percent slopes--2 percent  
 Inclusion 4: Duric Haplargids, loamy-skeletal, mixed, mesic gravelly sandy loam, 2 to 8 percent slopes--1 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants  
 Hollywell--Landform: Inset fans; position on slope: upper  
 Lyx--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: upper  
 Inclusion 2--Landform: Channels  
 Inclusion 3--Landform: Inset fans  
 Inclusion 4--Landform: Fan remnants; position on slope: upper

### ***Major Component Description***

#### **Unsel Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Hollywell Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Lyx Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Unsel: Bud sagebrush, galleta, shadscale  
 Hollywell: Douglas rabbitbrush, fourwing saltbush, galleta, shadscale  
 Lyx: Douglas rabbitbrush, fourwing saltbush  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Douglas rabbitbrush, Indian ricegrass  
 Inclusion 3: Bud sagebrush, winterfat  
 Inclusion 4: Bailey greasewood, shadscale

### ***Ecological Site***

Unsel: 029XY017NV  
 Hollywell: 029XY017NV  
 Lyx: 029XY046NV  
 Inclusion 1: 029XY049NV  
 Inclusion 2: 029XY041NV  
 Inclusion 3: 029XY042NV  
 Inclusion 4: 029XY087NV

## **1135--Unsel-Watoopah association**

### ***Composition***

#### **Major Components**

Unsel gravelly fine sandy loam, 2 to 4 percent slopes--70 percent  
 Watoopah gravelly loamy sand, 2 to 8 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Zadvar cobbly sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Lyx gravelly sandy loam, 2 to 8 percent slopes--4 percent  
 Inclusion 3: Stargo gravelly sandy loam, 0 to 2 percent slopes--4 percent  
 Inclusion 4: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 4 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants; position on slope: lower  
 Watoopah--Landform: Fan remnants  
 Inclusion 1--Landform: Fan remnants; geomorphic position: shoulder  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Inset fans  
 Inclusion 4--Landform: Channels

**Major Component Description****Unsel Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Watoopah Series**

*Elevation:* 5,500 to 6,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Unsel: Bud sagebrush, galleta, shadscale  
 Watoopah: Wyoming big sagebrush, bottlebrush squirreltail, spiny hopsage  
 Inclusion 1: Black sagebrush, galleta  
 Inclusion 2: Douglas rabbitbrush  
 Inclusion 3: Bud sagebrush, shadscale  
 Inclusion 4: Wyoming big sagebrush

**Ecological Site**

Unsel: 029XY017NV  
 Watoopah: 029XY049NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY046NV  
 Inclusion 3: 029XY017NV  
 Inclusion 4: 029XY049NV

**1136--Unsel-Eastgate-Stumble association****Composition**

**Major Components**  
 Unsel gravelly fine sandy loam, 2 to 4 percent slopes--35 percent  
 Eastgate loamy sand, 2 to 4 percent slopes--30 percent  
 Stumble loamy sand, 2 to 4 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Typic Torriorthents, sandy-skeletal, mixed, mesic gravelly loamy sand, 2 to 8 percent slopes--10 percent  
 Inclusion 2: Stargo gravelly sandy loam, 0 to 2 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants  
 Eastgate--Landform: Inset fans; position on slope: upper  
 Stumble--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: lower  
 Inclusion 2--Landform: Inset fans

**Major Component Description****Unsel Series**

*Elevation:* 5,200 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Eastgate Series**

*Elevation:* 5,200 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Stumble Series**

*Elevation:* 5,200 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Dominant Present Vegetation**

Unsel: Douglas rabbitbrush, bud sagebrush, galleta, shadscale  
 Eastgate: Indian ricegrass, fourwing saltbush, galleta  
 Stumble: Indian ricegrass, fourwing saltbush, littleleaf horsebrush  
 Inclusion 1: Douglas rabbitbrush, Indian ricegrass  
 Inclusion 2: Bud sagebrush, shadscale

**Ecological Site**

Unsel: 029XY017NV  
 Eastgate: 029XY046NV

Stumble: 029XY012NV  
 Inclusion 1: 029XY012NV  
 Inclusion 2: 029XY017NV

### 1137--Unsel-Koyen association

#### *Composition*

##### **Major Components**

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--50 percent  
 Koyen gravelly sandy loam, 2 to 4 percent slopes--35 percent

##### **Contrasting Inclusions**

Inclusion 1: Stumble very gravelly loamy sand, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Lyx extremely gravelly loamy sand, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Yomba gravelly fine sandy loam, 0 to 2 percent slopes--2 percent  
 Inclusion 4: Univega gravelly loamy sand, 2 to 8 percent slopes, moist--2 percent

#### *Map Unit Setting*

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants  
 Koyen--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Inset fans; position on slope: lower  
 Inclusion 4--Landform: Fan remnants; position on slope: lower

#### *Major Component Description*

##### **Unsel Series**

*Elevation:* 5,000 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Koyen Series**

*Elevation:* 5,000 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### *Dominant Present Vegetation*

Unsel: Douglas rabbitbrush, bud sagebrush, galleta, shadscale  
 Koyen: Douglas rabbitbrush, fourwing saltbush, galleta

Inclusion 1: Indian ricegrass  
 Inclusion 2: Douglas rabbitbrush, galleta  
 Inclusion 3: Bud sagebrush, galleta, shadscale  
 Inclusion 4: Galleta, spiny hopsage

#### *Ecological Site*

Unsel: 029XY017NV  
 Koyen: 029XY046NV  
 Inclusion 1: 029XY012NV  
 Inclusion 2: 029XY046NV  
 Inclusion 3: 029XY017NV  
 Inclusion 4: 029XY016NV

### 1138--Unsel-Zadvar association

#### *Composition*

##### **Major Components**

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--50 percent  
 Zadvar very gravelly sandy loam, 4 to 15 percent slopes--35 percent

##### **Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic extremely gravelly sandy loam, 2 to 30 percent slopes--6 percent  
 Inclusion 2: Duric Haplargids, loamy-skeletal, mixed, mesic gravelly sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Leo very gravelly sandy loam, 2 to 8 percent slopes--4 percent

#### *Map Unit Setting*

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants; position on slope: lower  
 Zadvar--Landform: Fan remnants  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Fan remnants; position on slope: lower  
 Inclusion 3--Landform: Inset fans

#### *Major Component Description*

##### **Unsel Series**

*Elevation:* 6,200 to 6,900 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Zadvar Series**

*Elevation:* 6,300 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel

*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

#### **Dominant Present Vegetation**

Unsel: Bud sagebrush, galleta, shadscale  
 Zadvar: Black sagebrush, galleta  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Bailey greasewood, galleta, shadscale  
 Inclusion 3: Spiny hopsage

#### **Ecological Site**

Unsel: 029XY017NV  
 Zadvar: 029XY008NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY087NV  
 Inclusion 3: 029XY016NV

### **1141--Unsel-Wardenot-Izo association**

#### **Composition**

##### **Major Components**

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--45 percent  
 Wardenot gravelly loamy sand, 2 to 8 percent slopes--25 percent  
 Izo gravelly sand, 2 to 4 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Unsel gravelly fine sandy loam, 2 to 8 percent slopes--7 percent  
 Inclusion 2: Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic gravelly sandy loam, 2 to 4 percent slopes--4 percent  
 Inclusion 3: Downeyville very gravelly sandy loam, 4 to 15 percent slopes--4 percent

#### **Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants  
 Wardenot--Landform: Inset fans  
 Izo--Landform: Inset fans; position on slope: lower  
 Inclusion 1--Landform: Fan remnants; position on slope: lower  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Pediments

#### **Major Component Description**

##### **Unsel Series**

*Elevation:* 4,900 to 6,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Wardenot Series**

*Elevation:* 4,900 to 6,000 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Izo Series**

*Elevation:* 4,900 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Dominant Present Vegetation**

Unsel: Indian ricegrass, shadscale  
 Wardenot: Bailey greasewood, Indian ricegrass, shadscale  
 Izo: Burrobrush  
 Inclusion 1: Bud sagebrush, galleta, shadscale  
 Inclusion 2: Bailey greasewood, spiny menodora  
 Inclusion 3: Galleta, shadscale

#### **Ecological Site**

Unsel: 029XY087NV  
 Wardenot: 029XY087NV  
 Izo: 029XY041NV  
 Inclusion 1: 029Y017NV  
 Inclusion 2: 029Y036NV  
 Inclusion 3: 029XY022NV

### **1142--Unsel-Annaw-Izo association**

#### **Composition**

##### **Major Components**

Unsel very gravelly fine sandy loam, 2 to 8 percent slopes--55 percent  
 Annaw gravelly sandy loam, 2 to 8 percent slopes--25 percent  
 Izo very gravelly sand, 2 to 15 percent slopes--10 percent

##### **Contrasting Inclusions**

Inclusion 1: Typic Haplargids, loamy-skeletal, mixed, mesic gravelly sandy loam, 8 to 15 percent slopes--8 percent  
 Inclusion 2: Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic gravelly sandy loam, 2 to 4 percent slopes--2 percent

#### **Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants

Annaw--Landform: Inset fans  
 Izo--Landform: Drainageways  
 Inclusion 1--Landform: Fan remnants; position on slope: upper  
 Inclusion 2--Landform: Inset fans; position on slope: upper

#### ***Major Component Description***

##### **Unsel Series**

*Elevation:* 4,000 to 5,500 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Annaw Series**

*Elevation:* 4,000 to 5,500 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Izo Series**

*Elevation:* 4,000 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Very gravelly sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Unsel: Bailey greasewood, shadscale  
 Annaw: Bailey greasewood, shadscale  
 Izo: Burrobrush  
 Inclusion 1: Bailey greasewood, shadscale  
 Inclusion 2: Bailey greasewood, galleta, shadscale, spiny menodora

#### ***Ecological Site***

Unsel: 029XY087NV  
 Annaw: 029XY087NV  
 Izo: 029XY041NV  
 Inclusion 1: 029XY087NV  
 Inclusion 2: 029XY036NV

## **1145--Unsel-Annaw association**

### ***Composition***

#### **Major Components**

Unsel very gravelly fine sandy loam, 4 to 30 percent slopes--70 percent  
 Annaw gravelly sandy loam, 2 to 8 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Izo very gravelly loamy sand, 2 to 8 percent slopes--5 percent  
 Inclusion 2: Cliffdown very gravelly sandy loam, 2 to 8 percent slopes--4 percent  
 Inclusion 3: Leo very gravelly sandy loam, 2 to 8 percent slopes--3 percent  
 Inclusion 4: Lyda very gravelly sandy loam, 2 to 4 percent slopes, moist--3 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants  
 Annaw--Landform: Inset fans  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Inset fans; position on slope: upper  
 Inclusion 4--Landform: Fan remnants; geomorphic position: summit

### ***Major Component Description***

#### **Unsel Series**

*Elevation:* 4,000 to 5,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Annaw Series**

*Elevation:* 4,000 to 5,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Unsel: Bailey greasewood, shadscale  
 Annaw: Bailey greasewood, shadscale  
 Inclusion 1: Burrobrush  
 Inclusion 2: Bud sagebrush  
 Inclusion 3: Galleta, spiny hopsage

Inclusion 4: Bailey greasewood, Nevada ephedra, shadscale

**Ecological Site**

Unsel: 029XY087NV  
 Annaw: 029XY087NV  
 Inclusion 1: 029XY041NV  
 Inclusion 2: 029XY042NV  
 Inclusion 3: 029XY016NV  
 Inclusion 4: 029XY087NV

**1146--Unsel-Silverbow-Izo association**

**Composition**

**Major Components**

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--45 percent  
 Silverbow very stony fine sandy loam, 8 to 15 percent slopes--20 percent  
 Izo very gravelly sand, 2 to 4 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Downeyville very cobbly fine sandy loam, 15 to 30 percent slopes--6 percent  
 Inclusion 2: Stumble loamy sand, 2 to 8 percent slopes--6 percent  
 Inclusion 3: Roic very gravelly fine sandy loam, 4 to 15 percent slopes, dry--3 percent

**Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Unsel--Landform: Fan remnants  
 Silverbow--Landform: Fan remnants; position on slope: upper  
 Izo--Landform: Inset fans  
 Inclusion 1--Landform: Hills; position on slope: lower; aspect: south  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Hills

**Major Component Description**

**Unsel Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Silverbow Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent cobbles; 20 percent gravel

*Surface layer texture:* Very stony fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Izo Series**

*Elevation:* 5,200 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Very gravelly sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Unsel: Bailey greasewood, bud sagebrush, galleta, shadscale  
 Silverbow: Bailey greasewood, bud sagebrush, galleta, shadscale  
 Izo: Burrobrush  
 Inclusion 1: Shadscale  
 Inclusion 2: Douglas rabbitbrush, Indian ricegrass  
 Inclusion 3: Bailey greasewood, shadscale

**Ecological Site**

Unsel: 029XY087NV  
 Silverbow: 029XY087NV  
 Izo: 029XY041NV  
 Inclusion 1: 029XY022NV  
 Inclusion 2: 029XY012NV  
 Inclusion 3: 029XY033NV

**1147--Unsel-Hollywell association**

**Composition**

**Major Components**

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--35 percent  
 Hollywell gravelly loamy sand, 2 to 8 percent slopes--30 percent  
 Hollywell gravelly loamy sand, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Izo very gravelly loamy sand, 2 to 8 percent slopes--7 percent  
 Inclusion 2: Unsel gravelly fine sandy loam, 2 to 8 percent slopes, moist--5 percent  
 Inclusion 3: Typic Torriorthents, sandy-skeletal, mixed, mesic very gravelly loamy sand, 2 to 8 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Unsel--Landform: Fan remnants  
 Hollywell--Landform: Inset fans; position on slope: upper  
 Hollywell--Landform: Inset fans  
 Inclusion 1--Landform: Channels

Inclusion 2--Landform: Fan remnants; position on slope: upper

Inclusion 3--Landform: Inset fans; position on slope: lower

### **Major Component Description**

#### **Unsel Series**

*Elevation:* 5,400 to 6,400 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Hollywell Series**

*Elevation:* 5,400 to 6,400 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 40 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Hollywell Series**

*Elevation:* 5,400 to 6,400 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 40 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### **Dominant Present Vegetation**

Unsel: Bud sagebrush, galleta, shadscale

Hollywell: Bailey greasewood, galleta, shadscale

Hollywell: Bailey greasewood, bud sagebrush, galleta, shadscale

Inclusion 1: Burrobrush

Inclusion 2: Bailey greasewood, galleta

Inclusion 3: Bud sagebrush, galleta, shadscale

### **Ecological Site**

Unsel: 029XY017NV

Hollywell: 029XY087NV

Hollywell: 029XY017NV

Inclusion 1: 029XY041NV

Inclusion 2: 029XY087NV

Inclusion 3: 029XY017NV

## **1148--Unsel-Ricert-Zaidy association**

### **Composition**

#### **Major Components**

Unsel gravelly fine sandy loam, 2 to 30 percent slopes--55 percent

Ricert gravelly sandy loam, 2 to 8 percent slopes--15 percent

Zaidy very gravelly fine sandy loam, 2 to 30 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Typic Camborthids, loamy-skeletal, mixed, mesic very gravelly fine sandy loam, 2 to 30 percent slopes--6 percent

Inclusion 2: Cliffdown very gravelly sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 3: Leo very gravelly sandy loam, 2 to 8 percent slopes--3 percent

Inclusion 4: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--1 percent

### **Map Unit Setting**

*Landscape position:* Fan piedmonts

Unsel--Landform: Fan remnants; geomorphic position: shoulder; position on slope: lower

Ricert--Landform: Fan remnants; geomorphic position: summit

Zaidy--Landform: Fan remnants; geomorphic position: shoulder; position on slope: upper

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Inset fans; position on slope: lower

Inclusion 3--Landform: Inset fans; position on slope: upper

Inclusion 4--Landform: Channels

### **Major Component Description**

#### **Unsel Series**

*Elevation:* 5,900 to 6,400 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Ricert Series**

*Elevation:* 5,900 to 6,300 feet

*Precipitation:* About 8 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 30 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Zaidy Series***Elevation:* 6,000 to 6,400 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface rock fragments:* 5 percent cobbles; 40 percent gravel*Surface layer texture:* Very gravelly fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks***Dominant Present Vegetation***

Unsel: Bailey greasewood, bud sagebrush, galleta, shadscale

Ricert: Indian ricegrass, bottlebrush squirreltail, bud sagebrush, shadscale

Zaidy: Indian ricegrass, black sagebrush, bottlebrush squirreltail, needleandthread

Inclusion 1: Bailey greasewood, bud sagebrush, shadscale

Inclusion 2: Winterfat

Inclusion 3: Spiny hopsage

Inclusion 4: Wyoming big sagebrush

***Ecological Site***

Unsel: 029XY087NV

Ricert: 028BY017NV

Zaidy: 028BY011NV

Inclusion 1: 027XY018NV

Inclusion 2: 029XY042NV

Inclusion 3: 029XY016NV

Inclusion 4: 029XY049NV

**1150--Nuyobe silt loam, 0 to 4 percent slopes*****Composition*****Major Components**

Nuyobe silt loam, 0 to 4 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Aquolls, 0 to 45 percent slopes--9 percent

Inclusion 2: Rustigate silt loam, 0 to 4 percent slopes--6 percent

***Map Unit Setting****Landscape position:* Bolsons

Nuyobe--Landform: Drainageways

Inclusion 1--Landform: Drainageways; position on slope: lower

Inclusion 2--Landform: Stream terraces

***Major Component Description*****Nuyobe Series***Elevation:* 5,600 to 7,000 feet*Precipitation:* About 6 inches*Air temperature:* About 54 degrees*Frost-free season:* About 140 days*Surface layer texture:* Silt loam*Drainage class:* Poorly drained*Dominant parent material:* Residuum derived from lacustrine sediments***Dominant Present Vegetation***

Nuyobe: Baltic rush, inland saltgrass

Inclusion 1: Nevada bluegrass

Inclusion 2: Black greasewood, inland saltgrass

***Ecological Site***

Nuyobe: 029XY002NV

Inclusion 1: 029XY001NV

Inclusion 2: 029XY004NV

**1162--Jung-Clanalpine-Colbar association*****Composition*****Major Components**

Jung very gravelly loam, 30 to 50 percent slopes--35 percent

Clanalpine very gravelly loam, 30 to 50 percent slopes--30 percent

Colbar cobbly loam, 30 to 50 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Old Camp very stony loam, 30 to 50 percent slopes--8 percent

Inclusion 2: Rock outcrop--4 percent

Inclusion 3: Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic very gravelly loam, 30 to 50 percent slopes--3 percent

***Map Unit Setting****Landscape position:* Mountains

Jung--Landform: Mountains; geomorphic position: backslope; aspect: south

Clanalpine--Landform: Mountains; geomorphic position: backslope; aspect: north

Colbar--Landform: Mountains; geomorphic position: backslope

Inclusion 1--Landform: Mountains

Inclusion 2--Landform: Mountains

Inclusion 3--Landform: Mountains; position on slope: upper

***Major Component Description*****Jung Series***Elevation:* 6,400 to 7,200 feet*Precipitation:* About 9 inches*Air temperature:* About 48 degrees*Frost-free season:* About 110 days*Surface rock fragments:* 5 percent cobbles; 40 percent gravel*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum derived from volcanic rocks**Clanalpine Series***Elevation:* 6,500 to 7,600 feet*Precipitation:* About 14 inches

*Air temperature:* About 43 degrees  
*Frost-free season:* About 90 days  
*Surface rock fragments:* 5 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Colbar Series**

*Elevation:* 6,400 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 100 days  
*Surface rock fragments:* 25 percent cobbles; 15 percent gravel  
*Surface layer texture:* Cobbly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Jung: Thurber needlegrass  
 Clanalpine: Thurber needlegrass, Utah juniper, singleleaf pinyon  
 Colbar: Wyoming big sagebrush  
 Inclusion 1: Bottlebrush squirreltail  
 Inclusion 2: None  
 Inclusion 3: Big sagebrush

#### ***Ecological Site***

Jung: 027XY032NV  
 Clanalpine: 028BY062NV  
 Colbar: 027XY007NV  
 Inclusion 1: 027XY007NV  
 Inclusion 2: none  
 Inclusion 3: 024XY028NV

### **1163--Jung-Hooplite association**

#### ***Composition***

**Major Components**  
 Jung very gravelly loam, 15 to 30 percent slopes--50 percent  
 Hooplite very gravelly sandy loam, 15 to 30 percent slopes--35 percent  
**Contrasting Inclusions**  
 Inclusion 1: Rock outcrop--8 percent  
 Inclusion 2: Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic very stony loam, 8 to 50 percent slopes--7 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Jung--Landform: Hills; geomorphic position: backslope; position on slope: upper  
 Hooplite--Landform: Hills  
 Inclusion 1--Landform: Hills  
 Inclusion 2--Landform: Hills; aspect: north

#### ***Major Component Description***

##### **Jung Series**

*Elevation:* 6,400 to 6,800 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 5 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from volcanic rocks

##### **Hooplite Series**

*Elevation:* 6,400 to 6,800 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 5 percent cobbles; 55 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Jung: Indian ricegrass, black sagebrush, bottlebrush squirreltail  
 Hooplite: Black sagebrush  
 Inclusion 1: None  
 Inclusion 2: Wyoming big sagebrush

#### ***Ecological Site***

Jung: 028BY016NV  
 Hooplite: 028BY016NV  
 Inclusion 1: none  
 Inclusion 2: 029XY010NV

### **1190--Penoyer-Geer association**

#### ***Composition***

**Major Components**  
 Penoyer silt loam, 0 to 2 percent slopes--45 percent  
 Geer fine sandy loam, 0 to 4 percent slopes--40 percent  
**Contrasting Inclusions**  
 Inclusion 1: Typic Torrifluvents, coarse-loamy, mixed (calcareous), mesic sandy loam, 0 to 4 percent slopes--6 percent  
 Inclusion 2: Sevenmile sandy loam, 0 to 4 percent slopes--5 percent  
 Inclusion 3: Easychair sandy loam, 0 to 2 percent slopes--2 percent  
 Inclusion 4: Xeric Torrifluvents, coarse-silty, mixed (calcareous), mesic sandy loam, 0 to 2 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Penoyer--Landform: Inset fans

Geer--Landform: Inset fans  
 Inclusion 1--Landform: Fan skirts  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Inset fans; position on slope:  
 lower  
 Inclusion 4--Landform: Channels

### ***Major Component Description***

#### **Penoyer Series**

*Elevation:* 5,000 to 6,400 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks

#### **Geer Series**

*Elevation:* 5,000 to 6,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent gravel  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks

### ***Dominant Present Vegetation***

Penoyer: Indian ricegrass, winterfat  
 Geer: Winterfat  
 Inclusion 1: Black greasewood  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Fourwing saltbush  
 Inclusion 4: Basin big sagebrush

### ***Ecological Site***

Penoyer: 029XY020NV  
 Geer: 029XY042NV  
 Inclusion 1: 029XY024NV  
 Inclusion 2: 029XY114NV  
 Inclusion 3: 029XY048NV  
 Inclusion 4: 029XY009NV

## **1191--Penoyer-Sevenmile association**

### ***Composition***

#### **Major Components**

Penoyer silt loam, 0 to 2 percent slopes--45 percent  
 Sevenmile fine sandy loam, 0 to 4 percent slopes--40  
 percent

#### **Contrasting Inclusions**

Inclusion 1: Veet gravelly sandy loam, 2 to 8 percent  
 slopes--6 percent  
 Inclusion 2: Fluventic Haploxerolls, coarse-loamy,  
 mixed, mesic sandy loam, 0 to 45 percent slopes--5  
 percent  
 Inclusion 3: Geer fine sandy loam, 0 to 8 percent  
 slopes--4 percent

### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Penoyer--Landform: Inset fans  
 Sevenmile--Landform: Inset fans; position on slope:  
 lower  
 Inclusion 1--Landform: Inset fans; position on slope:  
 upper  
 Inclusion 2--Landform: Channels  
 Inclusion 3--Landform: Inset fans; position on slope:  
 upper

### ***Major Component Description***

#### **Penoyer Series**

*Elevation:* 6,100 to 7,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks

#### **Sevenmile Series**

*Elevation:* 6,100 to 7,000 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks

### ***Dominant Present Vegetation***

Penoyer: Indian ricegrass, winterfat  
 Sevenmile: Wyoming big sagebrush  
 Inclusion 1: Indian ricegrass, Wyoming big sagebrush,  
 galleta, needleandthread  
 Inclusion 2: Basin big sagebrush  
 Inclusion 3: Indian ricegrass, bud sagebrush, winterfat

### ***Ecological Site***

Penoyer: 029XY020NV  
 Sevenmile: 029XY114NV  
 Inclusion 1: 029XY049NV  
 Inclusion 2: 029XY003NV  
 Inclusion 3: 029XY042NV

## **1220--Stewval-Beelem association**

### ***Composition***

#### **Major Components**

Stewval very stony fine sandy loam, 8 to 30 percent  
 slopes--45 percent  
 Beelem cobbly sandy loam, 15 to 50 percent slopes--  
 40 percent

#### **Contrasting Inclusions**

Inclusion 1: Zadvar very cobbly sandy loam, 2 to 8  
 percent slopes--8 percent  
 Inclusion 2: Veet very gravelly loamy sand, 2 to 8  
 percent slopes--3 percent

Inclusion 3: Rock outcrop--3 percent  
 Inclusion 4: Gabbvally very stony loam, 8 to 50 percent slopes--1 percent

### **Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Stewval--Landform: Hills; geomorphic position: backslope  
 Beelem--Landform: Hills; geomorphic position: backslope  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Fan remnants  
 Inclusion 3--Landform: Ridges  
 Inclusion 4--Landform: Hills

### **Major Component Description**

#### **Stewval Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very stony fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Beelem Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 15 percent cobbles; 45 percent gravel  
*Surface layer texture:* Cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

### **Dominant Present Vegetation**

Stewval: Black sagebrush, bottlebrush squirreltail  
 Beelem: Utah juniper, black sagebrush, singleleaf pinyon  
 Inclusion 1: Indian ricegrass, black sagebrush  
 Inclusion 2: Wyoming big sagebrush, galleta  
 Inclusion 3: None  
 Inclusion 4: Wyoming big sagebrush, galleta

### **Ecological Site**

Stewval: 029XY008NV  
 Beelem: 029XY081NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY049NV  
 Inclusion 3: none  
 Inclusion 4: 029XY010NV

## **1221--Stewval-Blacktop-Rock outcrop association**

### **Composition**

#### **Major Components**

Stewval very gravelly fine sandy loam, 15 to 50 percent slopes--40 percent  
 Blacktop very gravelly fine sandy loam, 30 to 75 percent slopes--30 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Zadvar very gravelly fine sandy loam, 8 to 15 percent slopes--7 percent  
 Inclusion 2: Downeyville very gravelly sandy loam, 8 to 30 percent slopes--5 percent  
 Inclusion 3: Xeric Torrifluvents, loamy-skeletal, mixed (calcareous), mesic sandy loam, 2 to 8 percent slopes--3 percent

### **Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Stewval--Landform: Hills; geomorphic position: backslope  
 Blacktop--Landform: Hills; geomorphic position: backslope; aspect: south  
 Rock outcrop--Landform: Ridges  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Hills; position on slope: lower  
 Inclusion 3--Landform: Drainageways

### **Major Component Description**

#### **Stewval Series**

*Elevation:* 5,800 to 6,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Blacktop Series**

*Elevation:* 5,800 to 6,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,800 to 6,600 feet  
*Surface layer texture:* Unweathered bedrock

### **Dominant Present Vegetation**

Stewval: Black sagebrush, galleta

Blacktop: Shadscale  
 Rock outcrop: None  
 Inclusion 1: Black sagebrush, galleta  
 Inclusion 2: Shadscale  
 Inclusion 3: Basin big sagebrush

#### ***Ecological Site***

Stewval: 029XY008NV  
 Blacktop: 029XY033NV  
 Rock outcrop: None  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY022NV  
 Inclusion 3: 029XY009NV

### **1222--Stewval-Downeyville-Gabbvally association**

#### ***Composition***

##### **Major Components**

Stewval very gravelly fine sandy loam, 15 to 50 percent slopes--40 percent  
 Downeyville very gravelly fine sandy loam, 15 to 50 percent slopes--30 percent  
 Gabbvally very gravelly sandy loam, 15 to 50 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--10 percent  
 Inclusion 2: Downeyville very cobbly fine sandy loam, 15 to 50 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Stewval--Landform: Hills; geomorphic position: backslope  
 Downeyville--Landform: Hills; geomorphic position: backslope; position on slope: lower; aspect: south  
 Gabbvally--Landform: Hills; geomorphic position: backslope; aspect: north  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Hills; position on slope: lower

#### ***Major Component Description***

##### **Stewval Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Downeyville Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Gabbvally Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Stewval: Black sagebrush, galleta  
 Downeyville: Bailey greasewood, galleta, spiny menodora  
 Gabbvally: Wyoming big sagebrush, galleta  
 Inclusion 1: None  
 Inclusion 2: Indian ricegrass, galleta

#### ***Ecological Site***

Stewval: 029XY008NV  
 Downeyville: 029XY037NV  
 Gabbvally: 029XY010NV  
 Inclusion 1: none  
 Inclusion 2: 029XY022NV

### **1223--Stewval-Rock outcrop association**

#### ***Composition***

##### **Major Components**

Stewval very gravelly fine sandy loam, 8 to 50 percent slopes--70 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Downeyville very gravelly sandy loam, 15 to 50 percent slopes--5 percent  
 Inclusion 2: Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic very stony loam, 15 to 50 percent slopes--4 percent  
 Inclusion 3: Lithic Argixerolls, loamy-skeletal, mixed, mesic very stony loam, 30 to 75 percent slopes--4 percent  
 Inclusion 4: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 15 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains  
 Stewval--Landform: Mountains; geomorphic position: backslope  
 Rock outcrop--Landform: Ridges  
 Inclusion 1--Landform: Mountains  
 Inclusion 2--Landform: Mountains

Inclusion 3--Landform: Mountains; position on slope: upper

Inclusion 4--Landform: Drainageways

### ***Major Component Description***

#### **Stewval Series**

*Elevation:* 6,200 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 51 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 55 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 6,200 to 7,200 feet

*Surface layer texture:* Unweathered bedrock

### ***Dominant Present Vegetation***

Stewval: Nevada ephedra, black sagebrush, galleta

Rock outcrop: None

Inclusion 1: Indian ricegrass, galleta

Inclusion 2: Wyoming big sagebrush

Inclusion 3: Black sagebrush, singleleaf pinyon

Inclusion 4: Wyoming big sagebrush

### ***Ecological Site***

Stewval: 029XY008NV

Rock outcrop: None

Inclusion 1: 029XY022NV

Inclusion 2: 029XY010NV

Inclusion 3: 029XY069NV

Inclusion 4: 029XY009NV

## **1226--Stewval-Bellehelen-Rock outcrop association**

### ***Composition***

#### **Major Components**

Stewval very gravelly fine sandy loam, 15 to 50 percent slopes--40 percent

Bellehelen very stony loam, 30 to 75 percent slopes--35 percent

Rock outcrop unweathered bedrock, 15 to 99 percent slopes--10 percent

#### **Contrasting Inclusions**

Inclusion 1: Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic, 30 to 75 percent slopes--10 percent

Inclusion 2: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 4 to 15 percent slopes--4 percent

Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 4 to 15 percent slopes--1 percent

### ***Map Unit Setting***

*Landscape position:* Mountains

Stewval--Landform: Hills; geomorphic position: backslope

Bellehelen--Landform: Mountains; geomorphic position: backslope; aspect: northeast

Rock outcrop--Landform: Ridges

Inclusion 1--Landform: Mountains

Inclusion 2--Landform: Drainageways

Inclusion 3--Landform: Drainageways; position on slope: upper

### ***Major Component Description***

#### **Stewval Series**

*Elevation:* 6,200 to 7,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 51 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 55 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Bellehelen Series**

*Elevation:* 6,200 to 7,400 feet

*Precipitation:* About 12 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 100 days

*Surface rock fragments:* 25 percent cobbles; 35 percent gravel

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 6,200 to 7,400 feet

*Surface layer texture:* Unweathered bedrock

### ***Dominant Present Vegetation***

Stewval: Black sagebrush

Bellehelen: Utah juniper, singleleaf pinyon

Rock outcrop: None

Inclusion 1: Wyoming big sagebrush

Inclusion 2: Basin big sagebrush, basin wildrye

Inclusion 3: Wyoming big sagebrush

### ***Ecological Site***

Stewval: 029XY008NV

Bellehelen: 029XY069NV

Rock outcrop: None

Inclusion 1: 029XY010NV

Inclusion 2: 029XY026NV

Inclusion 3: 029XY009NV

**1227--Stewval-Downeyville-Rock outcrop association****Composition****Major Components**

Stewval very stony fine sandy loam, 15 to 50 percent slopes--35 percent  
 Downeyville very cobbly fine sandy loam, 15 to 30 percent slopes--35 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Blacktop very cobbly sandy loam, 15 to 75 percent slopes--7 percent  
 Inclusion 2: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly loamy sand, 15 to 50 percent slopes--3 percent  
 Inclusion 3: Gabbvally very stony sandy loam, 15 to 50 percent slopes--3 percent  
 Inclusion 4: Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic very gravelly loamy sand, 2 to 15 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Hills  
 Stewval--Landform: Hills; geomorphic position: backslope  
 Downeyville--Landform: Hills; geomorphic position: backslope; aspect: south  
 Rock outcrop--Landform: Ridges  
 Inclusion 1--Landform: Hills  
 Inclusion 2--Landform: Drainageways  
 Inclusion 3--Landform: Hills; aspect: north  
 Inclusion 4--Landform: Drainageways

**Major Component Description****Stewval Series**

*Elevation:* 6,000 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very stony fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Downeyville Series**

*Elevation:* 6,000 to 7,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 25 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Rock outcrop Miscellaneous Area**

*Elevation:* 6,000 to 7,200 feet  
*Surface layer texture:* Unweathered bedrock

**Dominant Present Vegetation**

Stewval: Black sagebrush, galleta  
 Downeyville: Indian ricegrass, galleta  
 Rock outcrop: None  
 Inclusion 1: Bailey greasewood, shadscale  
 Inclusion 2: Basin big sagebrush  
 Inclusion 3: Indian ricegrass, Wyoming big sagebrush, galleta  
 Inclusion 4: Burrobrush

**Ecological Site**

Stewval: 029XY008NV  
 Downeyville: 029XY022NV  
 Rock outcrop: None  
 Inclusion 1: 029XY033NV  
 Inclusion 2: 029XY009NV  
 Inclusion 3: 029XY010NV  
 Inclusion 4: 029XY041NV

**1229--Stewval-Advokay-Itme association****Composition****Major Components**

Stewval very gravelly fine sandy loam, 8 to 15 percent slopes--35 percent  
 Advokay gravelly coarse sandy loam, 2 to 8 percent slopes--30 percent  
 Itme gravelly loamy sand, 2 to 4 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic sandy loam, 2 to 8 percent slopes--10 percent

**Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Stewval--Landform: Hills; geomorphic position: backslope  
 Advokay--Landform: Pediments; geomorphic position: summit  
 Itme--Landform: Alluvial fans  
 Inclusion 1--Landform: Drainageways

**Major Component Description****Stewval Series**

*Elevation:* 5,800 to 6,300 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Advokay Series**

*Elevation:* 5,800 to 6,300 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Gravelly coarse sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Itme Series**

*Elevation:* 5,800 to 6,300 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Stewval: Black sagebrush, galleta  
 Advokay: Indian ricegrass, shadscale  
 Itme: Indian ricegrass, shadscale  
 Inclusion 1: Big sagebrush

***Ecological Site***

Stewval: 029XY008NV  
 Advokay: 029XY017NV  
 Itme: 029XY017NV  
 Inclusion 1: 029XY009NV

**1230--Geer-Eastgate association*****Composition*****Major Components**

Geer fine sandy loam, 0 to 2 percent slopes--50 percent  
 Eastgate gravelly loamy sand, 2 to 4 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Stumble gravelly loamy sand, 2 to 8 percent slopes--8 percent  
 Inclusion 2: Unsel gravelly fine sandy loam, 2 to 4 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Bolsons  
 Geer--Landform: Inset fans  
 Eastgate--Landform: Fan skirts  
 Inclusion 1--Landform: Fan skirts  
 Inclusion 2--Landform: Fan remnants

***Major Component Description*****Geer Series**

*Elevation:* 5,600 to 5,900 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Eastgate Series**

*Elevation:* 5,600 to 5,900 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Geer: Douglas rabbitbrush, Indian ricegrass, winterfat  
 Eastgate: Douglas rabbitbrush, Indian ricegrass, fourwing saltbush, galleta, spiny hopsage  
 Inclusion 1: Douglas rabbitbrush, Indian ricegrass  
 Inclusion 2: Bud sagebrush, shadscale, winterfat

***Ecological Site***

Geer: 029XY042NV  
 Eastgate: 029XY046NV  
 Inclusion 1: 029XY012NV  
 Inclusion 2: 029XY017NV

**1231--Geer fine sandy loam, 0 to 2 percent slopes*****Composition*****Major Components**

Geer fine sandy loam, 0 to 2 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Eastgate gravelly loamy sand, 0 to 2 percent slopes--6 percent  
 Inclusion 2: Penoyer sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 3: Stargo loam, 0 to 2 percent slopes--4 percent

***Map Unit Setting***

*Landscape position:* Bolsons  
 Geer--Landform: Inset fans  
 Inclusion 1--Landform: Fan skirts  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Alluvial flats

***Major Component Description*****Geer Series**

*Elevation:* 5,600 to 6,100 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sandy loam

*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Geer: Indian ricegrass, winterfat  
 Inclusion 1: Douglas rabbitbrush, galleta, spiny hopsage  
 Inclusion 2: Winterfat  
 Inclusion 3: Bud sagebrush, shadscale

***Ecological Site***

Geer: 029XY042NV  
 Inclusion 1: 029XY046NV  
 Inclusion 2: 029XY020NV  
 Inclusion 3: 029XY017NV

**1233--Geer-Koyen association**

***Composition***

**Major Components**  
 Geer fine sandy loam, 0 to 4 percent slopes--55 percent  
 Koyen sandy loam, 0 to 4 percent slopes--30 percent  
**Contrasting Inclusions**  
 Inclusion 1: Playas--7 percent  
 Inclusion 2: Typic Torriorthents, loamy-skeletal, mixed (calcareous), mesic loamy sand, 2 to 84 percent slopes--4 percent  
 Inclusion 3: Koyen sandy loam, 0 to 4 percent slopes, moist--2 percent  
 Inclusion 4: Unsel gravelly sandy loam, 2 to 4 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Bolsons  
 Geer--Landform: Inset fans; position on slope: lower  
 Koyen--Landform: Inset fans; position on slope: upper  
 Inclusion 1--Landform: Playas  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Inset fans; position on slope: upper  
 Inclusion 4--Landform: Fan remnants

***Major Component Description***

**Geer Series**  
*Elevation:* 4,600 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Koyen Series**  
*Elevation:* 4,600 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days

*Surface layer texture:* Sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Geer: Bud sagebrush, winterfat  
 Koyen: Galleta  
 Inclusion 1: None  
 Inclusion 2: Indian ricegrass  
 Inclusion 3: Spiny hopsage  
 Inclusion 4: Bud sagebrush, galleta, shadscale

***Ecological Site***

Geer: 029XY042NV  
 Koyen: 029XY046NV  
 Inclusion 1: none  
 Inclusion 2: 029XY012NV  
 Inclusion 3: 029XY016NV  
 Inclusion 4: 029XY017NV

**1242--Stargo-Playas complex, 0 to 2 percent slopes**

***Composition***

**Major Components**  
 Stargo loam, 0 to 2 percent slopes--65 percent  
 Playas silty clay loam, 0 to 1 percent slopes--20 percent  
**Contrasting Inclusions**  
 Inclusion 1: Typic Torrifluents silty clay loam, 0 to 2 percent slopes--7 percent  
 Inclusion 2: Unsel gravelly sandy loam, 0 to 4 percent slopes--4 percent  
 Inclusion 3: Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic sandy loam, 0 to 4 percent slopes--2 percent  
 Inclusion 4: Xeric Torrifluents, fine-loamy, mixed (calcareous), mesic sandy loam, 0 to 2 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Bolsons  
 Stargo--Landform: Alluvial flats  
 Playas--Landform: Flood-plain playas  
 Inclusion 1--Landform: Alluvial flats; position on slope: lower  
 Inclusion 2--Landform: Fan remnants  
 Inclusion 3--Landform: Alluvial flats  
 Inclusion 4--Landform: Channels

***Major Component Description***

**Stargo Series**  
*Elevation:* 5,600 to 5,900 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loam  
*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Playas Miscellaneous Area**

*Elevation:* 5,600 to 5,900 feet

*Surface layer texture:* Silty clay loam

#### ***Dominant Present Vegetation***

Stargo: Bud sagebrush, shadscale

Playas: None

Inclusion 1: Bud sagebrush, galleta, shadscale

Inclusion 2: Bud sagebrush, galleta, shadscale

Inclusion 3: Winterfat

Inclusion 4: Wyoming big sagebrush, rubber rabbitbrush

#### ***Ecological Site***

Stargo: 029XY017NV

Playas: None

Inclusion 1: 029XY024NV

Inclusion 2: 029XY017NV

Inclusion 3: 029XY020NV

Inclusion 4: 029XY009NV

### **1243--Stargo-Playas-Slaw association**

#### ***Composition***

##### **Major Components**

Stargo coarse sandy loam, 0 to 2 percent slopes--45 percent

Playas silty clay loam, 0 to 1 percent slopes--25 percent

Slaw silt loam, 0 to 2 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Eastgate loamy sand, 0 to 2 percent slopes--9 percent

Inclusion 2: Xeric Torrifluvents, fine-loamy, mixed (calcareous), mesic sandy loam, 0 to 2 percent slopes--6 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons

Stargo--Landform: Alluvial flats

Playas--Landform: Playas

Slaw--Landform: Alluvial flats

Inclusion 1--Landform: Alluvial flats; position on slope: upper

Inclusion 2--Landform: Channels

#### ***Major Component Description***

##### **Stargo Series**

*Elevation:* 5,500 to 5,700 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Coarse sandy loam

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Playas Miscellaneous Area**

*Elevation:* 5,500 to 5,700 feet

*Surface layer texture:* Silty clay loam

#### **Slaw Series**

*Elevation:* 5,500 to 5,700 feet

*Precipitation:* About 5 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Stargo: Bud sagebrush, shadscale

Playas: None

Slaw: Black greasewood, bud sagebrush, shadscale

Inclusion 1: Douglas rabbitbrush, Indian ricegrass

Inclusion 2: Basin big sagebrush, rubber rabbitbrush

#### ***Ecological Site***

Stargo: 029XY017NV

Slaw: 029XY024NV

Playas: None

Inclusion 1: 029XY046NV

Inclusion 2: 029XY009NV

### **1252--Wardenot-Unsel-Yomba association**

#### ***Composition***

##### **Major Components**

Wardenot very gravely loamy sand, 2 to 8 percent slopes--35 percent

Unsel gravely loam, 2 to 8 percent slopes--30 percent

Yomba gravely fine sandy loam, 0 to 2 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Duric Haplargids, loamy-skeletal, mixed, mesic very gravely sandy loam, 2 to 8 percent slopes--9 percent

Inclusion 2: Izo very gravely loamy sand, 0 to 4 percent slopes--6 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons

Wardenot--Landform: Inset fans

Unsel--Landform: Fan remnants

Yomba--Landform: Fan skirts

Inclusion 1--Landform: Fan remnants; position on slope: lower

Inclusion 2--Landform: Inset fans

#### ***Major Component Description***

##### **Wardenot Series**

*Elevation:* 4,900 to 5,600 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 55 percent gravel

*Surface layer texture:* Very gravelly loamy sand

*Drainage class:* Excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Unsel Series**

*Elevation:* 4,900 to 5,600 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Yomba Series**

*Elevation:* 4,900 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 25 percent gravel

*Surface layer texture:* Gravelly fine sandy loam

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Wardenot: Bailey greasewood, bud sagebrush, galleta, shadscale

Unsel: Bailey greasewood, bud sagebrush, galleta, shadscale

Yomba: Bailey greasewood, bud sagebrush, galleta, shadscale

Inclusion 1: Bud sagebrush, galleta, shadscale

Inclusion 2: Burrobrush

#### ***Ecological Site***

Wardenot: 029XY087NV

Unsel: 029XY087NV

Yomba: 029XY087NV

Inclusion 1: 029XY017NV

Inclusion 2: 029XY041NV

### **1262--Berzatic-Kyler-Rock outcrop association**

#### ***Composition***

##### **Major Components**

Berzatic extremely cobbly fine sandy loam, 30 to 75 percent slopes--40 percent

Kyler extremely cobbly loam, 30 to 50 percent slopes--30 percent

Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Isolde fine sand, 4 to 30 percent slopes, moist--5 percent

Inclusion 2: Old Camp very stony sandy loam, 15 to 50 percent slopes--5 percent

Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly fine sandy loam, 2 to 8 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Hills

Berzatic--Landform: Hills; position on slope: lower

Kyler--Landform: Hills; position on slope: upper; aspect: north

Rock outcrop--Landform: Hills; position on slope: areas of exposed rock

Inclusion 1--Landform: Dunes

Inclusion 2--Landform: Hills

Inclusion 3--Landform: Drainageways

#### ***Major Component Description***

##### **Berzatic Series**

*Elevation:* 5,400 to 6,600 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 35 percent cobbles; 45 percent gravel

*Surface layer texture:* Extremely cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

##### **Kyler Series**

*Elevation:* 5,400 to 6,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 30 percent cobbles; 45 percent gravel

*Surface layer texture:* Extremely cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from limestone and dolomite

##### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,400 to 6,600 feet

*Surface layer texture:* Unweathered bedrock

#### ***Dominant Present Vegetation***

Berzatic: Bailey greasewood, spiny menodora

Kyler: Black sagebrush, galleta

Rock outcrop: None

Inclusion 1: Indian ricegrass

Inclusion 2: Wyoming big sagebrush

#### ***Ecological Site***

Berzatic: 029XY037NV

Kyler: 029XY014NV

Rock outcrop: None

Inclusion 1: 027XY023NV

Inclusion 2: 027XY007NV

Inclusion 3: 027XY029NV

## 1263--Berzatic-Downeyville-Pintwater association

### *Composition*

#### **Major Components**

Berzatic very cobbly fine sandy loam, 8 to 50 percent slopes--35 percent  
 Downeyville very cobbly fine sandy loam, 8 to 50 percent slopes--30 percent  
 Pintwater very gravelly fine sandy loam, 30 to 50 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--6 percent  
 Inclusion 2: Stewval very stony sandy loam, 8 to 30 percent slopes--5 percent  
 Inclusion 3: Maggie cobbly sandy loam, 8 to 30 percent slopes--4 percent

### *Map Unit Setting*

*Landscape position:* Hills

Berzatic--Landform: Hills; geomorphic position: backslope

Downeyville--Landform: Hills

Pintwater--Landform: Hills; geomorphic position: backslope

Inclusion 1--Landform: Ridges

Inclusion 2--Landform: Hills; position on slope: upper

Inclusion 3--Landform: Hills; geomorphic position: footslope

### *Major Component Description*

#### **Berzatic Series**

*Elevation:* 5,400 to 6,600 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 25 percent cobbles; 30 percent gravel

*Surface layer texture:* Very cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Downeyville Series**

*Elevation:* 5,400 to 6,600 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 25 percent cobbles; 35 percent gravel

*Surface layer texture:* Very cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Pintwater Series**

*Elevation:* 5,400 to 6,600 feet

*Precipitation:* About 5 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 10 percent cobbles; 40 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### *Dominant Present Vegetation*

Berzatic: Bailey greasewood, Indian ricegrass, galleta, shadscale

Downeyville: Indian ricegrass, galleta

Pintwater: Bailey greasewood, shadscale

Inclusion 1: None

Inclusion 2: Black sagebrush

Inclusion 3: Bailey greasewood, spiny menodora

### *Ecological Site*

Berzatic: 029XY022NV

Downeyville: 029XY022NV

Pintwater: 029XY022NV

Inclusion 1: none

Inclusion 2: 029XY008NV

Inclusion 3: 029XY037NV

## 1290--Oricto-Gynelle association

### *Composition*

#### **Major Components**

Oricto very cobbly fine sandy loam, 2 to 8 percent slopes--55 percent  
 Gynelle very gravelly loamy sand, 2 to 8 percent slopes--30 percent

#### **Contrasting Inclusions**

Inclusion 1: Gynelle very gravelly sandy loam, 2 to 4 percent slopes--7 percent

Inclusion 2: Typic Haplargids, sandy-skeletal, mixed, mesic very cobbly fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 3: Bluewing very gravelly loamy sand, 2 to 4 percent slopes--3 percent

### *Map Unit Setting*

*Landscape position:* Fan piedmonts

Oricto--Landform: Fan remnants

Gynelle--Landform: Inset fans

Inclusion 1--Landform: Inset fans; position on slope: lower

Inclusion 2--Landform: Fan remnants; position on slope: lower

Inclusion 3--Landform: Inset fans

### *Major Component Description*

#### **Oricto Series**

*Elevation:* 4,100 to 5,500 feet

*Precipitation:* About 5 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 25 percent cobbles; 25 percent gravel

*Surface layer texture:* Very cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Gynelle Series**

*Elevation:* 4,100 to 5,500 feet

*Precipitation:* About 4 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 60 percent gravel

*Surface layer texture:* Very gravelly loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Oricto: Bailey greasewood, Cooper wolfberry, shadscale

Gynelle: Bailey greasewood, Cooper wolfberry, shadscale

Inclusion 1: Black greasewood

Inclusion 2: Black greasewood, shadscale

Inclusion 3: Bailey greasewood, burrobrush

#### ***Ecological Site***

Oricto: 029XY032NV

Gynelle: 027XY043NV

Inclusion 1: 027XY036NV

Inclusion 2: 027XY036NV

Inclusion 3: 027XY022NV

### **1291--Oricto-Izo association**

#### ***Composition***

##### **Major Components**

Oricto very gravelly sandy loam, 4 to 30 percent slopes--75 percent

Izo very gravelly sand, 2 to 8 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Terlco very gravelly sandy loam, 2 to 15 percent slopes, dry--6 percent

Inclusion 2: Typic Torriorthents, sandy-skeletal, mixed, mesic gravelly loamy sand, 15 to 50 percent slopes--4 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Oricto--Landform: Fan remnants

Izo--Landform: Inset fans

Inclusion 1--Landform: Fan remnants

Inclusion 2--Landform: Inset fans; position on slope: upper

#### ***Major Component Description***

##### **Oricto Series**

*Elevation:* 4,100 to 5,200 feet

*Precipitation:* About 5 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 35 percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Izo Series**

*Elevation:* 4,100 to 5,200 feet

*Precipitation:* About 6 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 140 days

*Surface rock fragments:* 50 percent gravel

*Surface layer texture:* Very gravelly sand

*Drainage class:* Excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Oricto: Bailey greasewood, Cooper wolfberry, shadscale

Izo: Burrobrush

Inclusion 1: Bailey greasewood, galleta, shadscale

Inclusion 2: Bailey greasewood

#### ***Ecological Site***

Oricto: 029XY032NV

Izo: 029XY041NV

Inclusion 1: 029XY087NV

Inclusion 2: 029XY087NV

### **1292--Oricto-Luning association**

#### ***Composition***

##### **Major Components**

Oricto gravelly loamy sand, 2 to 8 percent slopes--60 percent

Luning gravelly loamy sand, 0 to 4 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Eastgate gravelly loamy sand, 0 to 4 percent slopes--6 percent

Inclusion 2: Stumble gravelly loamy fine sand, 4 to 30 percent slopes--2 percent

Inclusion 3: Typic Haplargids, sandy-skeletal, mixed, mesic loamy sand, 2 to 8 percent slopes--3 percent

Inclusion 4: Izo very gravelly loamy sand, 2 to 8 percent slopes--4 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Oricto--Landform: Fan remnants

Luning--Landform: Inset fans

Inclusion 1--Landform: Inset fans; position on slope: upper

Inclusion 2--Landform: Sand sheets

Inclusion 3--Landform: Fan remnants

Inclusion 4--Landform: Channels

**Major Component Description****Oricto Series**

*Elevation:* 4,100 to 5,000 feet

*Precipitation:* About 5 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 25 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Luning Series**

*Elevation:* 4,100 to 5,000 feet

*Precipitation:* About 4 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Oricto: Bailey greasewood, Cooper wolfberry, shadscale

Luning: Bailey greasewood, Cooper wolfberry, Indian ricegrass, fourwing saltbush

Inclusion 1: Galleta

Inclusion 2: Indian ricegrass, fourwing saltbush

Inclusion 3: Bailey greasewood, shadscale

Inclusion 4: Burrobrush

**Ecological Site**

Oricto: 029XY032NV

Luning: 027XY060NV

Inclusion 1: 029XY046NV

Inclusion 2: 029XY012NV

Inclusion 3: 029XY032NV

Inclusion 4: 029XY041NV

**1293--Oricto-Terlco-Roic association****Composition****Major Components**

Oricto very cobbly fine sandy loam, 2 to 8 percent slopes--40 percent

Terlco very gravelly fine sandy loam, 2 to 8 percent slopes--30 percent

Roic very gravelly fine sandy loam, 8 to 15 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Badland--6 percent

Inclusion 2: Wardenot very gravelly fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 3: Izo very gravelly loamy sand, 2 to 8 percent slopes--4 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Oricto--Landform: Fan remnants

Terlco--Landform: Fan remnants; geomorphic position: backslope; position on slope: upper

Roic--Landform: Pediments

Inclusion 1--Landform: Pediments

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Channels

**Major Component Description****Oricto Series**

*Elevation:* 5,200 to 5,800 feet

*Precipitation:* About 5 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 25 percent cobbles; 25 percent gravel

*Surface layer texture:* Very cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Terlco Series**

*Elevation:* 5,200 to 5,800 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 10 percent cobbles; 45 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Roic Series**

*Elevation:* 5,200 to 5,800 feet

*Precipitation:* About 4 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 45 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

**Dominant Present Vegetation**

Oricto: Bailey greasewood, Cooper wolfberry, shadscale

Terlco: Bailey greasewood, shadscale

Roic: Bailey greasewood, shadscale

Inclusion 1: None

Inclusion 2: Bailey greasewood, shadscale

Inclusion 3: Burrobrush

**Ecological Site**

Oricto: 029XY032NV

Terlco: 029XY087NV

Roic: 029XY033NV

Inclusion 1: none

Inclusion 2: 029XY087NV

Inclusion 3: 029XY041NV

### 1302--Ricert-Celeton association

#### *Composition*

##### **Major Components**

Ricert gravelly sandy loam, 2 to 8 percent slopes--60 percent

Celeton very gravelly loam, 4 to 15 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Typic Torriorthents, sandy, mixed, mesic loamy sand, 4 to 8 percent slopes--5 percent

Inclusion 2: Bluewing gravelly loamy sand, 2 to 4 percent slopes--5 percent

Inclusion 3: Typic Haplargids, fine-loamy, mixed, mesic sandy loam, 4 to 15 percent slopes--5 percent

#### *Map Unit Setting*

*Landscape position:* Hills and intermontane basins

Ricert--Landform: Fan remnants

Celeton--Landform: Pediments

Inclusion 1--Landform: Sand sheets

Inclusion 2--Landform: Channels

Inclusion 3--Landform: Pediments

#### *Major Component Description*

##### **Ricert Series**

*Elevation:* 4,600 to 5,200 feet

*Precipitation:* About 6 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 30 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Celeton Series**

*Elevation:* 4,600 to 5,200 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 50 percent gravel

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from diatomaceous earth

#### *Dominant Present Vegetation*

Ricert: Bailey greasewood, Indian ricegrass, shadscale

Celeton: Bailey greasewood, shadscale

Inclusion 1: Indian ricegrass

Inclusion 2: Indian ricegrass

Inclusion 3: Bailey greasewood, shadscale

#### *Ecological Site*

Ricert: 027XY018NV

Celeton: 027XY027NV

Inclusion 1: 027XY009NV

Inclusion 2: 027XY022NV

Inclusion 3: 027XY027NV

### 1303--Ricert-Luning association

#### *Composition*

##### **Major Components**

Ricert very gravelly loam, 2 to 8 percent slopes--55 percent

Luning gravelly loamy sand, 2 to 8 percent slopes--30 percent

##### **Contrasting Inclusions**

Inclusion 1: Celeton very gravelly loam, 2 to 15 percent slopes--10 percent

Inclusion 2: Terlco very cobbly fine sandy loam, 2 to 4 percent slopes, dry--5 percent

#### *Map Unit Setting*

*Landscape position:* Fan piedmonts

Ricert--Landform: Fan remnants

Luning--Landform: Inset fans

Inclusion 1--Landform: Pediments

Inclusion 2--Landform: Fan remnants; position on slope: upper

#### *Major Component Description*

##### **Ricert Series**

*Elevation:* 4,000 to 6,000 feet

*Precipitation:* About 6 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 10 percent cobbles; 45 percent gravel

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Luning Series**

*Elevation:* 4,000 to 6,000 feet

*Precipitation:* About 4 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### *Dominant Present Vegetation*

Ricert: Indian ricegrass, bud sagebrush, shadscale

Luning: Cooper wolfberry, Indian ricegrass, fourwing saltbush

Inclusion 1: Shadscale

Inclusion 2: Bailey greasewood, shadscale

**Ecological Site**

Ricert: 027XY018NV  
 Luning: 027XY060NV  
 Inclusion 1: 027XY034NV  
 Inclusion 2: 029XY087NV

**1304--Ricert-Cliffdown association****Composition****Major Components**

Ricert very gravelly sandy loam, 2 to 8 percent slopes--40 percent  
 Ricert very gravelly loam, 2 to 8 percent slopes--25 percent  
 Cliffdown gravelly sandy loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Lyx gravelly sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Leo gravelly loamy sand, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Izo very gravelly loamy sand, 2 to 4 percent slopes--4 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Ricert--Landform: Fan remnants; position on slope: upper  
 Ricert--Landform: Fan remnants  
 Cliffdown--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: lower  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Inset fans

**Major Component Description****Ricert Series**

*Elevation:* 4,600 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Ricert Series**

*Elevation:* 4,600 to 6,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Cliffdown Series**

*Elevation:* 4,600 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Ricert: Indian ricegrass, bottlebrush squirreltail, bud sagebrush, shadscale  
 Ricert: Bailey greasewood, Indian ricegrass, bottlebrush squirreltail, shadscale  
 Cliffdown: Indian ricegrass, winterfat  
 Inclusion 1: Douglas rabbitbrush  
 Inclusion 2: Spiny hopsage  
 Inclusion 3: Burrobrush

**Ecological Site**

Ricert: 027XY013NV  
 Ricert: 027XY018NV  
 Cliffdown: 029XY042NV  
 Inclusion 1: 029XY046NV  
 Inclusion 2: 029XY016NV  
 Inclusion 3: 029XY041NV

**1320--Terlco association****Composition****Major Components**

Terlco very gravelly fine sandy loam, 2 to 8 percent slopes--65 percent  
 Terlco very cobbly sandy loam, 15 to 30 percent slopes--30 percent

**Contrasting Inclusions**

Inclusion 1: Izo very gravelly loamy sand, 2 to 8 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Terlco--Landform: Fan remnants  
 Terlco--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 1--Landform: Channels

**Major Component Description****Terlco Series**

*Elevation:* 5,000 to 5,800 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Terlco Series**

*Elevation:* 5,000 to 5,800 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent cobbles; 30 percent gravel  
*Surface layer texture:* Very cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Terlco: Bailey greasewood, galleta, shadscale  
 Terlco: Bailey greasewood, galleta, shadscale  
 Inclusion 1: Burrobrush

***Ecological Site***

Terlco: 029XY087NV  
 Terlco: 029XY087NV  
 Inclusion 1: 029XY041NV

**1321--Terlco-Whirlo association*****Composition***

**Major Components**  
 Terlco very gravelly fine sandy loam, 2 to 8 percent slopes--50 percent  
 Whirlo gravelly sandy loam, 2 to 8 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Izo gravelly loamy sand, 2 to 8 percent slopes--10 percent  
 Inclusion 2: Typic Camborthids, sandy, mixed, mesic gravelly loamy sand, 2 to 4 percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Bolsons  
 Terlco--Landform: Fan remnants  
 Whirlo--Landform: Fan skirts  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Inset fans; position on slope: lower

***Major Component Description*****Terlco Series**

*Elevation:* 5,000 to 5,800 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Whirlo Series**

*Elevation:* 5,000 to 5,800 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Terlco: Bailey greasewood, galleta, shadscale  
 Whirlo: Bailey greasewood, Indian ricegrass  
 Inclusion 1: Burrobrush  
 Inclusion 2: Bailey greasewood

***Ecological Site***

Terlco: 029XY087NV  
 Whirlo: 027XY018NV  
 Inclusion 1: 029XY041NV  
 Inclusion 2: 027XY043NV

**1323--Terlco-Annaw-Izo association*****Composition***

**Major Components**  
 Terlco very gravelly fine sandy loam, 2 to 8 percent slopes--50 percent  
 Annaw very gravelly loamy sand, 2 to 8 percent slopes--25 percent  
 Izo extremely gravelly loamy sand, 2 to 4 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Singatse very gravelly sandy loam, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Goldyke gravelly sandy loam, 4 to 15 percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Terlco--Landform: Fan remnants  
 Annaw--Landform: Fan remnants; position on slope: lower  
 Izo--Landform: Inset fans  
 Inclusion 1--Landform: Pediments  
 Inclusion 2--Landform: Pediments

***Major Component Description*****Terlco Series**

*Elevation:* 5,000 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Annaw Series**

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 40 percent gravel

*Surface layer texture:* Very gravelly loamy sand

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Izo Series**

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 140 days

*Surface rock fragments:* 5 percent cobbles; 65 percent gravel

*Surface layer texture:* Extremely gravelly loamy sand

*Drainage class:* Excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Terlco: Bailey greasewood, bud sagebrush, spiny menodora

Annaw: Bailey greasewood, bud sagebrush, spiny menodora

Izo: Burrobrush

Inclusion 1: Shadscale

Inclusion 2: Bailey greasewood, galleta, shadscale

#### ***Ecological Site***

Terlco: 029XY036NV

Annaw: 029XY036NV

Izo: 029XY041NV

Inclusion 1: 027XY027NV

Inclusion 2: 029XY022NV

### **1326--Terlco-Lyda association**

#### ***Composition***

##### **Major Components**

Terlco very gravelly sandy loam, 2 to 15 percent slopes--65 percent

Lyda very gravelly fine sandy loam, 2 to 8 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Unsel very gravelly sandy loam, 2 to 8 percent slopes--6 percent

Inclusion 2: Leo very gravelly sandy loam, 2 to 8 percent slopes--6 percent

Inclusion 3: Izo very gravelly loamy sand, 2 to 8 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Terlco--Landform: Fan remnants; geomorphic position: backslope

Lyda--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Fan remnants; position on slope: lower

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Channels

#### ***Major Component Description***

##### **Terlco Series**

*Elevation:* 5,600 to 6,400 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 10 percent cobbles; 45 percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Lyda Series**

*Elevation:* 5,800 to 6,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 40 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Terlco: Bailey greasewood, shadscale, spiny menodora

Lyda: Bailey greasewood, spiny menodora

Inclusion 1: Bud sagebrush, shadscale

Inclusion 2: Galleta, spiny hopsage

Inclusion 3: Burrobrush

#### ***Ecological Site***

Terlco: 029XY036NV

Lyda: 029XY036NV

Inclusion 1: 029XY017NV

Inclusion 2: 029XY016NV

Inclusion 3: 029XY041NV

### **1330--Handpah-Veet association**

#### ***Composition***

##### **Major Components**

Handpah gravelly sandy loam, 2 to 8 percent slopes--65 percent

Veet very gravelly sandy loam, 2 to 8 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Leo gravelly sandy loam, 2 to 8 percent slopes--10 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Handpah--Landform: Fan remnants  
 Veet--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: lower

**Major Component Description****Handpah Series**

*Elevation:* 5,500 to 6,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Veet Series**

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Handpah: Wyoming big sagebrush, galleta, spiny hopsage  
 Veet: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 1: Galleta, horsebrush, spiny hopsage

**Ecological Site**

Handpah: 029XY006NV  
 Veet: 029XY049NV  
 Inclusion 1: 029XY016NV

**1331--Handpah-Veet-Unsel association****Composition****Major Components**

Handpah gravelly fine sandy loam, 2 to 8 percent slopes--35 percent  
 Veet very stony sandy loam, 2 to 8 percent slopes--30 percent  
 Unsel gravelly fine sandy loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Xerollic Durargids, loamy, mixed, mesic, shallow gravelly fine sandy loam, 2 to 8 percent slopes--10 percent

Inclusion 2: Xeric Torriorthents, sandy-skeletal, mixed, mesic very stony sandy loam, 2 to 4 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Handpah--Landform: Fan remnants  
 Veet--Landform: Inset fans  
 Unsel--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 2--Landform: Channels

**Major Component Description****Handpah Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Veet Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very stony sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Unsel Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Handpah: Wyoming big sagebrush, bottlebrush squirreltail, galleta  
 Veet: Douglas rabbitbrush, Wyoming big sagebrush, bottlebrush squirreltail, galleta  
 Unsel: Douglas rabbitbrush, bud sagebrush, galleta, shadscale  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Low sagebrush

**Ecological Site**

Handpah: 029XY006NV

Veet: 029XY049NV  
 Unsel: 029XY017NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY049NV

### 1332--Handpah-Chuckridge association

#### *Composition*

##### **Major Components**

Handpah gravelly fine sandy loam, 2 to 8 percent slopes--60 percent  
 Chuckridge gravelly sandy loam, 2 to 8 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Stewval very gravelly fine sandy loam, 4 to 30 percent slopes--10 percent  
 Inclusion 2: Eastgate loamy sand, 2 to 8 percent slopes--2 percent  
 Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly loamy sand, 2 to 8 percent slopes--2 percent  
 Inclusion 4: Rock outcrop--1 percent

#### *Map Unit Setting*

*Landscape position:* Fan piedmonts  
 Handpah--Landform: Fan remnants  
 Chuckridge--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 1--Landform: Pediments  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Channels  
 Inclusion 4--Landform: Pediments; geomorphic position: backslope

#### *Major Component Description*

##### **Handpah Series**

*Elevation:* 6,000 to 6,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

##### **Chuckridge Series**

*Elevation:* 6,000 to 6,500 feet  
*Precipitation:* About 8 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 25 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### *Dominant Present Vegetation*

Handpah: Douglas rabbitbrush, Indian ricegrass, Wyoming big sagebrush, galleta  
 Chuckridge: Black sagebrush, galleta  
 Inclusion 1: Indian ricegrass, black sagebrush, bottlebrush squirreltail, galleta  
 Inclusion 2: Fourwing saltbush, galleta  
 Inclusion 3: Wyoming big sagebrush  
 Inclusion 4: None

#### *Ecological Site*

Handpah: 029XY006NV  
 Chuckridge: 029XY008NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY046NV  
 Inclusion 3: 029XY009NV  
 Inclusion 4: none

### 1333--Handpah-Watoopah-Veet association

#### *Composition*

##### **Major Components**

Handpah gravelly fine sandy loam, 2 to 8 percent slopes--35 percent  
 Watoopah gravelly loamy sand, 2 to 8 percent slopes--30 percent  
 Veet very gravelly sandy loam, 2 to 8 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Chuckridge gravelly sandy loam, 2 to 8 percent slopes--9 percent  
 Inclusion 2: Xerollic Camborthids, loamy-skeletal, mixed, mesic stony sandy loam, 2 to 8 percent slopes--6 percent

#### *Map Unit Setting*

*Landscape position:* Fan piedmonts  
 Handpah--Landform: Fan remnants  
 Watoopah--Landform: Fan remnants; position on slope: lower  
 Veet--Landform: Inset fans  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Inset fans

#### *Major Component Description*

##### **Handpah Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Watoopah Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Veet Series**

*Elevation:* 6,000 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Handpah: Wyoming big sagebrush, bottlebrush squirreltail, galleta  
 Watoopah: Douglas rabbitbrush, Wyoming big sagebrush, bottlebrush squirreltail  
 Veet: Douglas rabbitbrush, Wyoming big sagebrush, bottlebrush squirreltail, galleta  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Wyoming big sagebrush

***Ecological Site***

Handpah: 029XY006NV  
 Watoopah: 029XY049NV  
 Veet: 029XY049NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY114NV

**1334--Handpah-Lyda association*****Composition*****Major Components**

Handpah very cobbly sandy loam, 2 to 8 percent slopes--45 percent  
 Lyda very cobbly fine sandy loam, 2 to 8 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Watoopah gravelly sandy loam, 2 to 8 percent slopes--8 percent  
 Inclusion 2: Chuckridge very cobbly sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Leo cobbly loamy sand, 2 to 8 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Handpah--Landform: Fan remnants  
 Lyda--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Fan remnants; geomorphic position: summit

Inclusion 3--Landform: Inset fans; position on slope: lower

***Major Component Description*****Handpah Series**

*Elevation:* 5,500 to 6,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent cobbles; 25 percent gravel  
*Surface layer texture:* Very cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Lyda Series**

*Elevation:* 5,800 to 6,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent cobbles; 25 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Handpah: Wyoming big sagebrush, galleta, spiny hopsage  
 Lyda: Galleta, shadscale  
 Inclusion 1: Indian ricegrass, Wyoming big sagebrush, galleta  
 Inclusion 2: Black sagebrush  
 Inclusion 3: Spiny hopsage

***Ecological Site***

Handpah: 029XY006NV  
 Lyda: 029XY017NV  
 Inclusion 1: 029XY049NV  
 Inclusion 2: 029XY008NV  
 Inclusion 3: 029XY016NV

**1351--Chill-Veet association*****Composition*****Major Components**

Chill gravelly sandy loam, 4 to 15 percent slopes--60 percent  
 Veet gravelly sandy loam, 2 to 8 percent slopes--30 percent

**Contrasting Inclusions**

Inclusion 1: Xerollic Haplargids, loamy-skeletal, mixed, mesic, shallow gravelly sandy loam, 2 to 8 percent slopes--7 percent  
 Inclusion 2: Rock outcrop--2 percent  
 Inclusion 3: Armespan very gravelly sandy loam, 2 to 8 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Chill--Landform: Hills  
 Veet--Landform: Inset fans  
 Inclusion 1--Landform: Fan remnants; position on slope: upper  
 Inclusion 2--Landform: Ridges  
 Inclusion 3--Landform: Fan remnants

**Major Component Description****Chill Series**

*Elevation:* 6,000 to 7,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from granitic rocks

**Veet Series**

*Elevation:* 6,000 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Chill: Indian ricegrass, Sandberg bluegrass, Sandberg bluegrass, Wyoming big sagebrush, spiny hopsage  
 Veet: Indian ricegrass, Wyoming big sagebrush, galleta, spiny hopsage  
 Inclusion 1: Black sagebrush, galleta  
 Inclusion 2: None  
 Inclusion 3: Black sagebrush, galleta

**Ecological Site**

Chill: 027XY008NV  
 Veet: 029XY049NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: none  
 Inclusion 3: 029XY008NV

**1360--Wabuska-Playas-Isolde association****Composition****Major Components**

Wabuska loamy sand, 0 to 2 percent slopes--40 percent  
 Playas silty clay loam, 0 to 1 percent slopes--30 percent  
 Isolde fine sand, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Typic Natrargids, fine-loamy over sandy or sandy-skeletal, mixed, mesic loam, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Bluewing very gravelly loamy sand, 0 to 2 percent slopes--3 percent  
 Inclusion 3: Gynelle very gravelly loamy sand, 0 to 2 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Bolsons  
 Wabuska--Landform: Lake plains  
 Playas--Landform: Playas; shape of slope: concave  
 Isolde--Landform: Dunes  
 Inclusion 1--Landform: Alluvial flats  
 Inclusion 2--Landform: Channels  
 Inclusion 3--Landform: Alluvial flats

**Major Component Description****Wabuska Series**

*Elevation:* 4,100 to 4,400 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Somewhat poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Playas Miscellaneous Area**

*Elevation:* 4,100 to 4,400 feet  
*Surface layer texture:* Silty clay loam

**Isolde Series**

*Elevation:* 4,100 to 4,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Dominant Present Vegetation**

Wabuska: Alkali sacaton, black greasewood, inland saltgrass  
 Playas: None  
 Isolde: Indian ricegrass, black sagebrush  
 Inclusion 1: Black greasewood, shadscale  
 Inclusion 2: Burrobrush  
 Inclusion 3: Black greasewood

**Ecological Site**

Wabuska: 027XY005NV  
 Isolde: 027XY016NV  
 Playas: None  
 Inclusion 1: 027XY025NV  
 Inclusion 2: 027XY022NV  
 Inclusion 3: 027XY036NV

**1390--Jevets-Stumble-Univega association****Composition****Major Components**

Jevets fine sand, 2 to 8 percent slopes--40 percent  
 Stumble loamy sand, 0 to 4 percent slopes--30 percent  
 Univega gravelly fine sand, 2 to 4 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Typic Calciorthids, coarse-loamy, mixed, mesic gravelly sand, 2 to 8 percent slopes--10 percent  
 Inclusion 2: Eastgate loamy sand, 2 to 4 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Jevets--Landform: Fan remnants  
 Stumble--Landform: Inset fans  
 Univega--Landform: Fan remnants; geomorphic position: summit; position on slope: upper  
 Inclusion 1--Landform: Fan remnants; position on slope: lower  
 Inclusion 2--Landform: Inset fans

**Major Component Description****Jevets Series**

*Elevation:* 5,800 to 6,200 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sand  
*Drainage class:* Well drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Stumble Series**

*Elevation:* 5,800 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Univega Series**

*Elevation:* 5,800 to 6,200 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Jevets: Indian ricegrass, black sagebrush, fourwing saltbush, littleleaf horsebrush, spiny hopsage

Stumble: Indian ricegrass, fourwing saltbush, littleleaf horsebrush, spiny hopsage  
 Univega: Douglas rabbitbrush, bottlebrush squirreltail, fourwing saltbush, galleta, littleleaf horsebrush  
 Inclusion 1: Fourwing saltbush, galleta  
 Inclusion 2: Fourwing saltbush, galleta

**Ecological Site**

Jevets: 029XY012NV  
 Stumble: 029XY012NV  
 Univega: 029XY046NV  
 Inclusion 1: 029XY046NV  
 Inclusion 2: 029XY046NV

**1410--Watoopah-Veet association****Composition****Major Components**

Watoopah gravelly loamy sand, 2 to 4 percent slopes--50 percent  
 Veet very stony sandy loam, 2 to 8 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torripsamments, mixed, mesic loamy sand, 2 to 8 percent slopes--8 percent  
 Inclusion 2: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly loamy sand, 2 to 8 percent slopes--3 percent  
 Inclusion 3: Zadvar cobbly sandy loam, 2 to 4 percent slopes--2 percent  
 Inclusion 4: Xerollic Camborthids, coarse-loamy, mixed, mesic sandy loam, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Watoopah--Landform: Fan remnants  
 Veet--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: lower  
 Inclusion 2--Landform: Channels  
 Inclusion 3--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 4--Landform: Inset fans

**Major Component Description****Watoopah Series**

*Elevation:* 5,500 to 6,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Veet Series**

*Elevation:* 5,500 to 6,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very stony sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Watoopah: Indian ricegrass, Wyoming big sagebrush, galleta, spiny hopsage  
 Veet: Indian ricegrass, Wyoming big sagebrush, galleta, spiny hopsage  
 Inclusion 1: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 2: Basin big sagebrush  
 Inclusion 3: Black sagebrush, galleta  
 Inclusion 4: Indian ricegrass, Wyoming big sagebrush

#### ***Ecological Site***

Watoopah: 029XY049NV  
 Veet: 029XY049NV  
 Inclusion 1: 029XY006NV  
 Inclusion 2: 029XY009NV  
 Inclusion 3: 029XY008NV  
 Inclusion 4: 029XY114NV

### **1412--Watoopah-Veet-Zadvar association**

#### ***Composition***

##### **Major Components**

Watoopah gravelly loamy sand, 2 to 8 percent slopes--45 percent  
 Veet very stony sandy loam, 2 to 4 percent slopes--25 percent  
 Zadvar gravelly fine sandy loam, 2 to 8 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Xeric Torripsamments, mixed, mesic loamy sand, 2 to 8 percent slopes--8 percent  
 Inclusion 2: Xeric Torriorthents very cobbly sandy loam, 8 to 50 percent slopes--5 percent  
 Inclusion 3: Stewval very gravelly fine sandy loam, 8 to 30 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Watoopah--Landform: Fan remnants  
 Veet--Landform: Inset fans  
 Zadvar--Landform: Fan remnants; geomorphic position: summit  
 Inclusion 1--Landform: Dunes  
 Inclusion 2--Landform: Fan remnants  
 Inclusion 3--Landform: Pediments

#### ***Major Component Description***

##### **Watoopah Series**

*Elevation:* 6,400 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Veet Series**

*Elevation:* 6,400 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very stony sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Zadvar Series**

*Elevation:* 6,400 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Watoopah: Indian ricegrass, Wyoming big sagebrush, galleta  
 Veet: Indian ricegrass, Wyoming big sagebrush  
 Zadvar: Black sagebrush, galleta  
 Inclusion 1: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 2: Black sagebrush  
 Inclusion 3: Black sagebrush, galleta

#### ***Ecological Site***

Watoopah: 029XY049NV  
 Veet: 029XY049NV  
 Zadvar: 029XY008NV  
 Inclusion 1: 029XY006NV  
 Inclusion 2: 029XY008NV  
 Inclusion 3: 029XY008NV

### **1420--Squawtip-Bellehelen-Rock outcrop association**

#### ***Composition***

##### **Major Components**

Squawtip very stony loam, 30 to 75 percent slopes--45 percent  
 Bellehelen very stony loam, 30 to 75 percent slopes--25 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

**Contrasting Inclusions**

- Inclusion 1: Suak very stony loam, 15 to 50 percent slopes--5 percent  
 Inclusion 2: Packer very gravelly loam, 15 to 50 percent slopes--5 percent  
 Inclusion 3: Fluventic Haploxerolls, loamy-skeletal, mixed, mesic sandy loam, 4 to 15 percent slopes--4 percent  
 Inclusion 4: Aquolls, 2 to 15 percent slopes--1 percent

**Map Unit Setting**

- Landscape position:* Mountains  
 Squawtip--Landform: Mountains; geomorphic position: backslope; aspect: north  
 Bellehelen--Landform: Mountains; geomorphic position: backslope  
 Rock outcrop--Landform: Mountains; position on slope: areas of exposed rock  
 Inclusion 1--Landform: Mountains; shape of slope: concave  
 Inclusion 2--Landform: Mountains  
 Inclusion 3--Landform: Mountains  
 Inclusion 4--Landform: Mountains

**Major Component Description****Squawtip Series**

- Elevation:* 7,000 to 9,500 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 100 days  
*Surface rock fragments:* 30 percent cobbles; 15 percent gravel  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Bellehelen Series**

- Elevation:* 7,000 to 9,500 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 100 days  
*Surface rock fragments:* 25 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Rock outcrop Miscellaneous Area**

- Elevation:* 7,000 to 9,500 feet  
*Surface layer texture:* Unweathered bedrock

**Dominant Present Vegetation**

- Squawtip: Mountain big sagebrush, singleleaf pinyon  
 Bellehelen: Black sagebrush, singleleaf pinyon  
 Rock outcrop: None  
 Inclusion 1: Curlleaf mountainmahogany  
 Inclusion 2: Low sagebrush  
 Inclusion 3: Basin big sagebrush  
 Inclusion 4: Nevada bluegrass

**Ecological Site**

- Squawtip: 029XY066NV  
 Bellehelen: 029XY069NV  
 Rock outcrop: None  
 Inclusion 1: 029XY027NV  
 Inclusion 2: 029XY052NV  
 Inclusion 3: 029XY026NV  
 Inclusion 4: 029XY060NV

**1421--Squawtip-Gabbvally-Rock outcrop association****Composition****Major Components**

- Squawtip very stony loam, 15 to 50 percent slopes--40 percent  
 Gabbvally very gravelly sandy loam, 8 to 50 percent slopes--35 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--10 percent

**Contrasting Inclusions**

- Inclusion 1: Bellehelen very stony loam, 15 to 50 percent slopes--6 percent  
 Inclusion 2: Lithic Argixerolls, loamy-skeletal, mixed, frigid extremely stony loam, 30 to 75 percent slopes--4 percent  
 Inclusion 3: Old Camp very stony loam, 15 to 50 percent slopes--4 percent  
 Inclusion 4: Aridic Haploxerolls, loamy-skeletal, mixed, mesic very gravelly loam, 2 to 8 percent slopes--1 percent

**Map Unit Setting**

- Landscape position:* Mountains  
 Squawtip--Landform: Hills; geomorphic position: backslope  
 Gabbvally--Landform: Hills; geomorphic position: backslope; position on slope: lower  
 Rock outcrop--Landform: Mountains; position on slope: areas of exposed rock  
 Inclusion 1--Landform: Mountains  
 Inclusion 2--Landform: Mountains; aspect: north  
 Inclusion 3--Landform: Mountains  
 Inclusion 4--Landform: Drainageways

**Major Component Description****Squawtip Series**

- Elevation:* 6,500 to 7,400 feet  
*Precipitation:* About 14 inches  
*Air temperature:* About 44 degrees  
*Frost-free season:* About 100 days  
*Surface rock fragments:* 30 percent cobbles; 15 percent gravel  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Gabbvally Series**

- Elevation:* 6,500 to 7,300 feet

*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 6,500 to 7,400 feet  
*Surface layer texture:* Unweathered bedrock

#### ***Dominant Present Vegetation***

Squawtip: Indian ricegrass, Utah juniper, bluegrass, mountain big sagebrush, singleleaf pinyon  
 Gabbvally: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail  
 Rock outcrop: None  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Singleleaf pinyon  
 Inclusion 3: Bottlebrush squirreltail  
 Inclusion 4: Basin big sagebrush

#### ***Ecological Site***

Squawtip: 029XY066NV  
 Gabbvally: 029XY010NV  
 Rock outcrop: None  
 Inclusion 1: 029XY069NV  
 Inclusion 2: 029XY066NV  
 Inclusion 3: 027XY007NV  
 Inclusion 4: 028BY003NV

### **1430--Bellehelen-Rock outcrop association**

#### ***Composition***

##### **Major Components**

Bellehelen very stony loam, 15 to 50 percent slopes--70 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Stewval very gravelly fine sandy loam, 15 to 50 percent slopes--5 percent  
 Inclusion 2: Squawtip very stony loam, 50 to 75 percent slopes--4 percent  
 Inclusion 3: Fluventic Haploxerolls, loamy-skeletal, mixed, mesic very stony loam, 4 to 15 percent slopes--4 percent  
 Inclusion 4: Aquolls, 2 to 8 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Mountains  
 Bellehelen--Landform: Mountains; geomorphic position: backslope  
 Rock outcrop--Landform: Mountains; position on slope: areas of exposed rock  
 Inclusion 1--Landform: Mountains; position on slope: lower

Inclusion 2--Landform: Mountains; position on slope: upper; aspect: north  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Drainageways

#### ***Major Component Description***

##### **Bellehelen Series**

*Elevation:* 6,200 to 7,400 feet  
*Precipitation:* About 12 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 100 days  
*Surface rock fragments:* 25 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Rock outcrop Miscellaneous Area**

*Elevation:* 6,200 to 7,400 feet  
*Surface layer texture:* Unweathered bedrock

#### ***Dominant Present Vegetation***

Bellehelen: Sandberg bluegrass, Utah juniper, black sagebrush, singleleaf pinyon  
 Rock outcrop: None  
 Inclusion 1: Willow  
 Inclusion 2: Mountain big sagebrush, singleleaf pinyon  
 Inclusion 3: Basin big sagebrush  
 Inclusion 4: Nevada bluegrass

#### ***Ecological Site***

Bellehelen: 029XY069NV  
 Rock outcrop: None  
 Inclusion 1: 029XY060NV  
 Inclusion 2: 029XY066NV  
 Inclusion 3: 029XY003NV  
 Inclusion 4: 029XY060NV

### **1451--Grassval-Zaidy-Alley association**

#### ***Composition***

##### **Major Components**

Grassval gravelly loam, 2 to 8 percent slopes--35 percent  
 Zaidy very gravelly fine sandy loam, 2 to 30 percent slopes--25 percent  
 Alley gravelly sandy loam, 2 to 8 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Xerollic Camborthids, coarse-loamy, mixed, mesic sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Xerollic Durargids, loamy, mixed, mesic, shallow very gravelly loam, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic fine sandy loam, 2 to 8 percent slopes--2 percent  
 Inclusion 4: Xeric Torriorthents, sandy-skeletal, mixed, mesic loamy sand, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Grassval--Landform: Fan remnants; geomorphic position: summit  
 Zaidy--Landform: Fan remnants; geomorphic position: backslope  
 Alley--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Fan remnants  
 Inclusion 3--Landform: Channels; position on slope: upper  
 Inclusion 4--Landform: Channels

**Major Component Description****Grassval Series**

*Elevation:* 6,700 to 7,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Zaidy Series**

*Elevation:* 6,700 to 7,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 5 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Alley Series**

*Elevation:* 6,700 to 7,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Dominant Present Vegetation**

Grassval: Indian ricegrass, black sagebrush, bottlebrush squirreltail, needleandthread  
 Zaidy: Indian ricegrass, black sagebrush, bottlebrush squirreltail, needleandthread  
 Alley: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 1: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 2: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 3: Indian ricegrass, Wyoming big sagebrush, basin wildrye  
 Inclusion 4: Basin big sagebrush, basin wildrye

**Ecological Site**

Grassval: 028BY011NV  
 Zaidy: 028BY011NV  
 Alley: 028BY010NV  
 Inclusion 1: 029XY010NV  
 Inclusion 2: 029XY010NV  
 Inclusion 3: 028BY045NV  
 Inclusion 4: 028BY003NV

**1452--Grassval-Dewar-Alley association****Composition****Major Components**

Grassval gravelly loam, 2 to 8 percent slopes--35 percent  
 Dewar gravelly loam, 2 to 8 percent slopes--30 percent  
 Alley gravelly sandy loam, 2 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Zaidy very gravelly sandy loam, 4 to 50 percent slopes--6 percent  
 Inclusion 2: Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic fine sandy loam, 2 to 8 percent slopes--4 percent  
 Inclusion 3: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic very cobbly sandy loam, 15 to 50 percent slopes--4 percent  
 Inclusion 4: Aridic Haploxerolls, loamy-skeletal, mixed, mesic loamy sand, 2 to 8 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Grassval--Landform: Fan remnants  
 Dewar--Landform: Fan remnants; position on slope: upper  
 Alley--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Fan remnants; geomorphic position: shoulder  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Fan remnants  
 Inclusion 4--Landform: Channels

**Major Component Description****Grassval Series**

*Elevation:* 6,900 to 7,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dewar Series**

*Elevation:* 6,900 to 7,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 40 percent gravel

*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Alley Series**

*Elevation:* 6,900 to 7,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

#### **Dominant Present Vegetation**

Grassval: Indian ricegrass, black sagebrush, bottlebrush squirreltail, needleandthread  
 Dewar: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail  
 Alley: Wyoming big sagebrush, bottlebrush squirreltail, rabbitbrush  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Utah juniper, black sagebrush  
 Inclusion 4: Basin big sagebrush

#### **Ecological Site**

Grassval: 028BY011NV  
 Dewar: 028BY080NV  
 Alley: 028BY010NV  
 Inclusion 1: 028BY011NV  
 Inclusion 2: 028XB045NV  
 Inclusion 3: 028BY083NV  
 Inclusion 4: 028BY003NV

### **1453--Grassval-Defler-Ricert association**

#### **Composition**

##### **Major Components**

Grassval gravelly loam, 2 to 15 percent slopes--50 percent  
 Defler gravelly fine sandy loam, 2 to 4 percent slopes--20 percent  
 Ricert gravelly fine sandy loam, 2 to 8 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Xerollic Camborthids, loamy-skeletal, mixed, mesic fine sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Portmount gravelly sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Rebel sandy loam, 2 to 8 percent slopes--2 percent  
 Inclusion 4: Aridic Haploxerolls, loamy-skeletal, mixed, mesic fine sandy loam, 2 to 4 percent slopes--2 percent

#### **Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Grassval--Landform: Fan remnants; position on slope: upper  
 Defler--Landform: Inset fans  
 Ricert--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Inset fans; position on slope: lower  
 Inclusion 4--Landform: Channels

#### **Major Component Description**

##### **Grassval Series**

*Elevation:* 6,000 to 6,800 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Defler Series**

*Elevation:* 5,900 to 6,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Ricert Series**

*Elevation:* 5,900 to 6,600 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Dominant Present Vegetation**

Grassval: Indian ricegrass, black sagebrush, bottlebrush squirreltail, needleandthread  
 Defler: Indian ricegrass, winterfat  
 Ricert: Indian ricegrass, bud sagebrush, shadscale  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 3: Wyoming big sagebrush  
 Inclusion 4: Basin big sagebrush

#### **Ecological Site**

Grassval: 028BY011NV  
 Defler: 028BY013NV  
 Ricert: 028BY013NV

Inclusion 1: 028BY045NV  
 Inclusion 2: 028BY010NV  
 Inclusion 3: 028BY045NV  
 Inclusion 4: 028BY003NV

## 1454--Grassval-Wieland association

### *Composition*

#### **Major Components**

Grassval gravelly loam, 2 to 8 percent slopes--45 percent

Wieland gravelly loam, 2 to 8 percent slopes--40 percent

#### **Contrasting Inclusions**

Inclusion 1: Zaidy clay loam, 4 to 30 percent slopes--5 percent

Inclusion 2: Hooplite very gravelly loam, 2 to 15 percent slopes--5 percent

Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very cobbly sandy loam, 15 to 50 percent slopes--3 percent

Inclusion 4: Ricert gravelly loam, moist, 2 to 8 percent slopes--2 percent

### *Map Unit Setting*

*Landscape position:* Fan piedmonts

Grassval--Landform: Fan remnants; position on slope: upper

Wieland--Landform: Fan remnants

Inclusion 1--Landform: Fan remnants; geomorphic position: shoulder

Inclusion 2--Landform: Hills

Inclusion 3--Landform: Fan remnants

Inclusion 4--Landform: Fan remnants; geomorphic position: shoulder; position on slope: lower

### *Major Component Description*

#### **Grassval Series**

*Elevation:* 6,200 to 6,900 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Wieland Series**

*Elevation:* 6,200 to 6,900 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 25 percent gravel

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### *Dominant Present Vegetation*

Grassval: Indian ricegrass, black sagebrush, bottlebrush squirreltail, needleandthread

Wieland: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 1: Black sagebrush

Inclusion 2: Black sagebrush

Inclusion 3: Wyoming big sagebrush, rabbitbrush

Inclusion 4: Shadscale

### *Ecological Site*

Grassval: 028BY011NV

Wieland: 028BY010NV

Inclusion 1: 028BY011NV

Inclusion 2: 028BY016NV

Inclusion 3: 028BY010NV

Inclusion 4: 028BY017NV

## 1460--Zadvar-Handpah association

### *Composition*

#### **Major Components**

Zadvar very gravelly sandy loam, 2 to 8 percent slopes--60 percent

Handpah gravelly fine sandy loam, 4 to 8 percent slopes--25 percent

#### **Contrasting Inclusions**

Inclusion 1: Veet very gravelly sandy loam, 2 to 8 percent slopes--7 percent

Inclusion 2: Watoopah gravelly loamy sand, 2 to 8 percent slopes--5 percent

Inclusion 3: Stewval cobbly sandy loam, 8 to 30 percent slopes--3 percent

### *Map Unit Setting*

*Landscape position:* Fan piedmonts

Zadvar--Landform: Fan remnants; position on slope: upper

Handpah--Landform: Fan remnants

Inclusion 1--Landform: Inset fans; position on slope: lower

Inclusion 2--Landform: Fan remnants

Inclusion 3--Landform: Pediments

### *Major Component Description*

#### **Zadvar Series**

*Elevation:* 6,200 to 6,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 50 percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks

#### **Handpah Series**

*Elevation:* 6,200 to 6,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Zadvar: Black sagebrush, galleta  
 Handpah: Indian ricegrass, Wyoming big sagebrush, galleta  
 Inclusion 1: Indian ricegrass  
 Inclusion 2: Indian ricegrass, Wyoming big sagebrush, galleta  
 Inclusion 3: Black sagebrush, galleta

#### ***Ecological Site***

Zadvar: 029XY008NV  
 Handpah: 029XY006NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY049NV  
 Inclusion 3: 029XY008NV

### **1461--Zadvar-Chuckridge-Watoopah association**

#### ***Composition***

##### **Major Components**

Zadvar gravelly fine sandy loam, 2 to 8 percent slopes--35 percent  
 Chuckridge gravelly sandy loam, 2 to 4 percent slopes--30 percent  
 Watoopah gravelly loamy sand, 2 to 8 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Stewval very gravelly sandy loam, 8 to 15 percent slopes--7 percent  
 Inclusion 2: Handpah gravelly sandy loam, 2 to 8 percent slopes--2 percent  
 Inclusion 3: Unsel very gravelly sandy loam, 2 to 4 percent slopes--1 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Zadvar--Landform: Fan remnants; geomorphic position: backslope  
 Chuckridge--Landform: Fan remnants; geomorphic position: summit  
 Watoopah--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Pediments  
 Inclusion 2--Landform: Fan remnants; position on slope: upper  
 Inclusion 3--Landform: Fan remnants; position on slope: lower

#### ***Major Component Description***

##### **Zadvar Series**

*Elevation:* 6,000 to 6,800 feet

*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

##### **Chuckridge Series**

*Elevation:* 6,000 to 6,800 feet  
*Precipitation:* About 8 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 25 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

##### **Watoopah Series**

*Elevation:* 6,000 to 6,800 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Zadvar: Black sagebrush, galleta  
 Chuckridge: Black sagebrush, galleta  
 Watoopah: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Indian ricegrass, Wyoming big sagebrush, galleta  
 Inclusion 3: Bud sagebrush, shadscale

#### ***Ecological Site***

Zadvar: 029XY008NV  
 Chuckridge: 029XY008NV  
 Watoopah: 029XY049NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY006NV  
 Inclusion 3: 029XY017NV

### **1462--Zadvar-Chuckridge association**

#### ***Composition***

##### **Major Components**

Zadvar gravelly fine sandy loam, 2 to 8 percent slopes--50 percent  
 Chuckridge gravelly sandy loam, 2 to 8 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 2: Xerollic Durargids very gravelly sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 3: Rock outcrop--3 percent

Inclusion 4: Veet gravelly sandy loam, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Zadvar--Landform: Fan remnants; geomorphic position: backslope

Chuckridge--Landform: Fan remnants; geomorphic position: summit

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Fan remnants; position on slope: upper

Inclusion 3--Landform: Pediments; geomorphic position: backslope

Inclusion 4--Landform: Inset fans

**Major Component Description****Zadvar Series**

*Elevation:* 6,000 to 6,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks

**Chuckridge Series**

*Elevation:* 6,000 to 6,800 feet

*Precipitation:* About 8 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 25 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks

**Dominant Present Vegetation**

Zadvar: Black sagebrush, galleta

Chuckridge: Black sagebrush, galleta

Inclusion 1: Black sagebrush

Inclusion 2: Utah juniper, black sagebrush, singleleaf pinyon

Inclusion 3: None

Inclusion 4: Wyoming big sagebrush

**Ecological Site**

Zadvar: 029XY008NV

Chuckridge: 029XY008NV

Inclusion 1: 029XY008NV

Inclusion 2: 029XY069NV

Inclusion 3: none

Inclusion 4: 029XY049NV

**1463--Zadvar-Veet association****Composition****Major Components**

Zadvar very gravelly sandy loam, 2 to 8 percent slopes--65 percent

Veet very gravelly sandy loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Watoopah gravelly loamy sand, 4 to 15 percent slopes--8 percent

Inclusion 2: Unsel cobbly fine sandy loam, 2 to 8 percent slopes--4 percent

Inclusion 3: Stewval cobbly fine sandy loam, 8 to 15 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Zadvar--Landform: Fan remnants

Veet--Landform: Inset fans

Inclusion 1--Landform: Inset fans; position on slope: lower

Inclusion 2--Landform: Fan remnants; position on slope: lower

Inclusion 3--Landform: Pediments

**Major Component Description****Zadvar Series**

*Elevation:* 6,100 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 50 percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks

**Veet Series**

*Elevation:* 6,100 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 10 percent cobbles; 35 percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Zadvar: Black sagebrush, galleta

Veet: Indian ricegrass, Wyoming big sagebrush, galleta

Inclusion 1: Wyoming big sagebrush, needleandthread

Inclusion 2: Bud sagebrush, galleta, shadscale

Inclusion 3: Black sagebrush, galleta

***Ecological Site***

Zadvar: 029XY008NV  
 Veet: 029XY049NV  
 Inclusion 1: 029XY049NV  
 Inclusion 2: 029XY017NV  
 Inclusion 3: 029XY008NV

**1464--Zadvar-Stewval association*****Composition*****Major Components**

Zadvar gravelly fine sandy loam, 2 to 8 percent slopes--50 percent  
 Stewval very gravelly fine sandy loam, 8 to 15 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic very gravelly loamy sand, 2 to 8 percent slopes--10 percent  
 Inclusion 2: Unsel very gravelly fine sandy loam, moist, 2 to 8 percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Zadvar--Landform: Fan remnants  
 Stewval--Landform: Hills  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Fan remnants; position on slope: lower

***Major Component Description*****Zadvar Series**

*Elevation:* 6,100 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

**Stewval Series**

*Elevation:* 6,100 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

***Dominant Present Vegetation***

Zadvar: Black sagebrush, galleta  
 Stewval: Black sagebrush, galleta  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Bailey greasewood, shadscale

***Ecological Site***

Zadvar: 029XY008NV  
 Stewval: 029XY008NV  
 Inclusion 1: 029XY006NV  
 Inclusion 2: 029XY087NV

**1465--Zadvar-Unsel association*****Composition*****Major Components**

Zadvar very gravelly sandy loam, 2 to 15 percent slopes--55 percent  
 Unsel very gravelly fine sandy loam, 2 to 8 percent slopes--30 percent

**Contrasting Inclusions**

Inclusion 1: Watoopah gravelly sandy loam, 2 to 8 percent slopes--7 percent  
 Inclusion 2: Wardenot very gravelly loamy sand, 4 to 30 percent slopes--4 percent  
 Inclusion 3: Sevenmile sandy loam, 2 to 8 percent slopes--4 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Zadvar--Landform: Fan remnants; position on slope: upper  
 Unsel--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Channels

***Major Component Description*****Zadvar Series**

*Elevation:* 5,500 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

**Unsel Series**

*Elevation:* 5,400 to 6,200 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Zadvar: Black sagebrush, galleta

Unsel: Bailey greasewood, bud sagebrush, galleta, shadscale  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Bailey greasewood, bud sagebrush, galleta, shadscale  
 Inclusion 3: Wyoming big sagebrush

#### ***Ecological Site***

Zadvar: 029XY008NV  
 Unsel: 029XY087NV  
 Inclusion 1: 029XY049NV  
 Inclusion 2: 029XY087NV  
 Inclusion 3: 029XY114NV

### **1466--Zadvar-Barnmot-Unsel association**

#### ***Composition***

##### **Major Components**

Zadvar very gravelly sandy loam, 4 to 30 percent slopes--35 percent  
 Barnmot gravelly clay loam, 15 to 50 percent slopes--30 percent  
 Unsel very gravelly fine sandy loam, 2 to 8 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic very gravelly sandy loam, 30 to 50 percent slopes--5 percent  
 Inclusion 2: Cliffdown very gravelly sandy loam, 2 to 8 percent slopes--4 percent  
 Inclusion 3: Lyx very gravelly sandy loam, 2 to 8 percent slopes--4 percent  
 Inclusion 4: Rock outcrop--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Zadvar--Landform: Fan remnants; position on slope: upper  
 Barnmot--Landform: Hills  
 Unsel--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Inset fans  
 Inclusion 4--Landform: Ridges

#### ***Major Component Description***

##### **Zadvar Series**

*Elevation:* 6,000 to 6,800 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from lacustrine sediments

##### **Barnmot Series**

*Elevation:* 6,000 to 6,800 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly clay loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from lacustrine sediments

##### **Unsel Series**

*Elevation:* 5,900 to 6,700 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Zadvar: Black sagebrush, galleta  
 Barnmot: Bailey greasewood, shadscale  
 Unsel: Douglas rabbitbrush, bud sagebrush, galleta  
 Inclusion 1: Black sagebrush, galleta  
 Inclusion 2: Bottlebrush squirreltail, bud sagebrush, winterfat  
 Inclusion 3: Douglas rabbitbrush  
 Inclusion 4: None

#### ***Ecological Site***

Zadvar: 029XY008NV  
 Barnmot: 029XY022NV  
 Unsel: 029XY087NV  
 Inclusion 1: 029XY014NV  
 Inclusion 2: 029XY042NV  
 Inclusion 3: 029XY046NV  
 Inclusion 4: none

### **1470--Cirac-Wardenot-Slaw association**

#### ***Composition***

##### **Major Components**

Cirac sandy loam, 0 to 4 percent slopes--40 percent  
 Wardenot gravelly fine sandy loam, 2 to 4 percent slopes--30 percent  
 Slaw silt loam, 0 to 2 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Kawich fine sand, 2 to 30 percent slopes--6 percent  
 Inclusion 2: Rustigate sandy loam, 0 to 4 percent slopes--3 percent  
 Inclusion 3: Nuyobe sandy loam, 0 to 2 percent slopes--1 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Cirac--Landform: Alluvial flats

Wardenot--Landform: Fan skirts; position on slope: upper

Slaw--Landform: Alluvial flats; position on slope: lower

Inclusion 1--Landform: Dunes

Inclusion 2--Landform: Alluvial flats

Inclusion 3--Landform: Alluvial flats

### ***Major Component Description***

#### **Cirac Series**

*Elevation:* 5,600 to 6,100 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Wardenot Series**

*Elevation:* 5,600 to 6,100 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 40 percent gravel

*Surface layer texture:* Gravelly fine sandy loam

*Drainage class:* Excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Slaw Series**

*Elevation:* 5,600 to 6,100 feet

*Precipitation:* About 5 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Cirac: Black greasewood, shadscale

Wardenot: Black greasewood, shadscale

Slaw: Torrey quailbush, basin big sagebrush, black greasewood

Inclusion 1: Black greasewood

Inclusion 2: Inland saltgrass

Inclusion 3: Baltic rush

### ***Ecological Site***

Cirac: 029XY024NV

Wardenot: 029XY024NV

Slaw: 029XY093NV

Inclusion 1: 029XY018NV

Inclusion 2: 029XY004NV

Inclusion 3: 029XY002NV

## **1476--Cirac-Kawich association**

### ***Composition***

#### **Major Components**

Cirac fine sandy loam, 0 to 2 percent slopes--50 percent

Kawich fine sand, 0 to 15 percent slopes--35 percent

#### **Contrasting Inclusions**

Inclusion 1: Cirac fine sandy loam, 0 to 4 percent slopes--5 percent

Inclusion 2: Playas--5 percent

Inclusion 3: Duric Camborthids, 0 to 4 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Bolsons

Cirac--Landform: Alluvial flats

Kawich--Landform: Dunes

Inclusion 1--Landform: Alluvial flats; position on slope: lower

Inclusion 2--Landform: Playas

Inclusion 3--Landform: Alluvial flats; position on slope: upper

### ***Major Component Description***

#### **Cirac Series**

*Elevation:* 4,400 to 5,200 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Kawich Series**

*Elevation:* 4,400 to 5,200 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Fine sand

*Drainage class:* Excessively drained

*Dominant parent material:* Eolian sand and mixed alluvium

### ***Dominant Present Vegetation***

Cirac: Black greasewood, shadscale

Kawich: Black greasewood

Inclusion 1: Black greasewood, seepweed, shadscale

Inclusion 2: None

Inclusion 3: Mountain big sagebrush

### ***Ecological Site***

Cirac: 029XY024NV

Kawich: 029XY018NV

Inclusion 1: 029XY076NV

Inclusion 2: none

Inclusion 3: 029XY051NV

**1477--Cirac-Stumble association****Composition****Major Components**

Cirac sandy loam, 0 to 4 percent slopes--45 percent

Cirac fine sandy loam, 0 to 2 percent slopes--25 percent

Stumble loamy sand, 0 to 2 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Typic Torriorthents, fine-loamy, mixed, mesic very gravelly fine sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Izo gravelly loamy sand, 0 to 2 percent slopes--5 percent

Inclusion 3: Kawich fine sand, 8 to 30 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Bolsons

Cirac--Landform: Alluvial flats

Cirac--Landform: Alluvial flats; position on slope: lower

Stumble--Landform: Fan skirts

Inclusion 1--Landform: Inset fans; position on slope: upper

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Dunes

**Major Component Description****Cirac Series**

*Elevation:* 4,600 to 5,200 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Cirac Series**

*Elevation:* 4,600 to 5,200 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Stumble Series**

*Elevation:* 4,600 to 5,200 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Cirac: Black greasewood, shadscale

Cirac: Black greasewood

Stumble: Indian ricegrass, fourwing saltbush

Inclusion 1: Bailey greasewood

Inclusion 2: Burrobrush

Inclusion 3: Indian ricegrass, black greasewood

**Ecological Site**

Cirac: 029XY024NV

Cirac: 029XY076NV

Stumble: 029XY012NV

Inclusion 1: 029XY039NV

Inclusion 2: 029XY041NV

Inclusion 3: 029XY018NV

**1481--Chuckridge-Unsel-Veet association****Composition****Major Components**

Chuckridge gravelly sandy loam, 2 to 8 percent slopes--35 percent

Unsel gravelly fine sandy loam, 2 to 8 percent slopes--30 percent

Veet very gravelly sandy loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Lyx very gravelly loamy sand, 2 to 8 percent slopes--7 percent

Inclusion 2: Stewval very cobbly sandy loam, 15 to 30 percent slopes--5 percent

Inclusion 3: Handpah gravelly sandy loam, 2 to 8 percent slopes--2 percent

Inclusion 4: Xeric Torrifluvents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Chuckridge--Landform: Fan remnants; position on slope: upper

Unsel--Landform: Fan remnants; position on slope: lower

Veet--Landform: Inset fans

Inclusion 1--Landform: Inset fans; position on slope: lower

Inclusion 2--Landform: Pediments

Inclusion 3--Landform: Fan remnants

Inclusion 4--Landform: Channels

**Major Component Description****Chuckridge Series**

*Elevation:* 5,800 to 7,000 feet

*Precipitation:* About 8 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 25 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks

**Unsel Series***Elevation:* 5,800 to 7,000 feet*Precipitation:* About 6 inches*Air temperature:* About 53 degrees*Frost-free season:* About 120 days*Surface rock fragments:* 30 percent gravel*Surface layer texture:* Gravelly fine sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks**Veet Series***Elevation:* 5,800 to 7,000 feet*Precipitation:* About 9 inches*Air temperature:* About 53 degrees*Frost-free season:* About 120 days*Surface rock fragments:* 10 percent cobbles; 35 percent gravel*Surface layer texture:* Very gravelly sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks***Dominant Present Vegetation***

Chuckridge: Black sagebrush, galleta

Unsel: Bud sagebrush, galleta, shadscale

Veet: Wyoming big sagebrush, spiny hopsage

Inclusion 1: Douglas rabbitbrush

Inclusion 2: Black sagebrush

Inclusion 3: Wyoming big sagebrush

Inclusion 4: Basin big sagebrush

***Ecological Site***

Chuckridge: 029XY008NV

Unsel: 029XY017NV

Veet: 029XY049NV

Inclusion 1: 029XY046NV

Inclusion 2: 029XY008NV

Inclusion 3: 029XY006NV

Inclusion 4: 029XY009NV

**1483--Chuckridge gravelly sandy loam, 2 to 8 percent slopes*****Composition*****Major Components**

Chuckridge gravelly sandy loam, 2 to 8 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Veet gravelly sandy loam, 2 to 8 percent slopes--9 percent

Inclusion 2: Xerollic Camborthids, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--3 percent

Inclusion 3: Stewval stony fine sandy loam, 4 to 15 percent slopes--3 percent

***Map Unit Setting****Landscape position:* Fan piedmonts

Chuckridge--Landform: Fan remnants

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Inset fans; position on slope: upper

Inclusion 3--Landform: Pediments

***Major Component Description*****Chuckridge Series***Elevation:* 6,000 to 6,800 feet*Precipitation:* About 8 inches*Air temperature:* About 53 degrees*Frost-free season:* About 120 days*Surface rock fragments:* 5 percent cobbles; 25 percent gravel*Surface layer texture:* Gravelly sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from volcanic rocks***Dominant Present Vegetation***

Chuckridge: Black sagebrush, bottlebrush squirreltail, galleta

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Utah juniper, black sagebrush, singleleaf pinyon

Inclusion 3: Black sagebrush

***Ecological Site***

Chuckridge: 029XY008NV

Inclusion 1: 029XY049NV

Inclusion 2: 029XY069NV

Inclusion 3: 029XY008NV

**1492--Slaw-Rustigate association*****Composition*****Major Components**

Slaw silt loam, 0 to 2 percent slopes--50 percent

Rustigate silt loam, 0 to 2 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Typic Torriorthents, sandy-skeletal, mixed, mesic gravelly sandy loam, 4 to 15 percent slopes--3 percent

Inclusion 3: Typic Torripsamments, mixed, mesic loamy sand, 4 to 15 percent slopes--2 percent

***Map Unit Setting****Landscape position:* Bolsons

Slaw--Landform: Alluvial flats; position on slope: upper

Rustigate--Landform: Alluvial flats; position on slope: lower

Inclusion 1--Landform: Alluvial flats; position on slope: lower

Inclusion 2--Landform: Alluvial flats

Inclusion 3--Landform: Dunes

**Major Component Description****Slaw Series**

*Elevation:* 5,400 to 5,900 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Rustigate Series**

*Elevation:* 5,400 to 5,900 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Somewhat poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Slaw: Black greasewood, shadscale  
 Rustigate: Alkali sacaton, basin wildrye  
 Inclusion 1: Black greasewood  
 Inclusion 2: Black greasewood, shadscale  
 Inclusion 3: Indian ricegrass, black greasewood

**Ecological Site**

Slaw: 029XY024NV  
 Rustigate: 029XY004NV  
 Inclusion 1: 029XY076NV  
 Inclusion 2: 029XY024NV  
 Inclusion 3: 029XY018NV

**1493--Slaw-Stargo-Geer association****Composition****Major Components**

Slaw silt loam, 0 to 2 percent slopes--35 percent  
 Stargo loam, 0 to 2 percent slopes--30 percent  
 Geer fine sandy loam, 0 to 2 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Typic Torriorthents, fine-loamy, mixed, mesic sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Eastgate loamy sand, 0 to 2 percent slopes--2 percent  
 Inclusion 3: Stumble loamy sand, 0 to 2 percent slopes--2 percent  
 Inclusion 4: Playas--1 percent

**Map Unit Setting**

*Landscape position:* Bolsons  
 Slaw--Landform: Alluvial flats  
 Stargo--Landform: Fan skirts  
 Geer--Landform: Fan skirts; position on slope: lower  
 Inclusion 1--Landform: Fan skirts  
 Inclusion 2--Landform: Fan skirts; position on slope: upper

Inclusion 3--Landform: Sand sheets  
 Inclusion 4--Landform: Playas

**Major Component Description****Slaw Series**

*Elevation:* 5,300 to 5,500 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Stargo Series**

*Elevation:* 5,300 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Geer Series**

*Elevation:* 5,300 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Slaw: Black greasewood, bottlebrush squirreltail, galleta, shadscale  
 Stargo: Bailey greasewood, Indian ricegrass, bud sagebrush, shadscale, spiny hopsage  
 Geer: Indian ricegrass, galleta, shadscale, winterfat  
 Inclusion 1: Black greasewood, shadscale  
 Inclusion 2: Fourwing saltbush, galleta, horsebrush  
 Inclusion 3: Douglas rabbitbrush, Indian ricegrass  
 Inclusion 4: None

**Ecological Site**

Slaw: 029XY024NV  
 Stargo: 029XY017NV  
 Geer: 029XY042NV  
 Inclusion 1: 029XY018NV  
 Inclusion 2: 029XY046NV  
 Inclusion 3: 029XY012NV  
 Inclusion 4: none

**1494--Slaw-Gitakup association****Composition****Major Components**

Slaw loamy fine sand, 0 to 2 percent slopes--35 percent

Slaw silt loam, 0 to 2 percent slopes--25 percent  
 Gitakup silty clay loam, 0 to 2 percent slopes--25 percent

#### **Contrasting Inclusions**

Inclusion 1: Playas--5 percent  
 Inclusion 2: Isolde fine sand, 4 to 15 percent slopes--5 percent  
 Inclusion 3: Wabuska loamy sand, 0 to 2 percent slopes--5 percent

#### **Map Unit Setting**

*Landscape position:* Bolsons  
 Slaw--Landform: Alluvial flats; position on slope: upper  
 Slaw--Landform: Alluvial flats; position on slope: lower  
 Gitakup--Landform: Lake terraces  
 Inclusion 1--Landform: Playas  
 Inclusion 2--Landform: Dunes  
 Inclusion 3--Landform: Lake plains

#### **Major Component Description**

##### **Slaw Series**

*Elevation:* 4,600 to 5,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Loamy fine sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Slaw Series**

*Elevation:* 4,600 to 5,000 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Gitakup Series**

*Elevation:* 4,600 to 5,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Silty clay loam  
*Drainage class:* Moderately well drained  
*Dominant parent material:* Residuum derived from lacustrine sediments

#### **Dominant Present Vegetation**

Slaw: Torrey quailbush  
 Slaw: Indian ricegrass, black greasewood  
 Gitakup: Black greasewood  
 Inclusion 1: None  
 Inclusion 2: Indian ricegrass, black greasewood  
 Inclusion 3: Inland saltgrass

#### **Ecological Site**

Slaw: 027XY041NV  
 Slaw: 027XY025NV

Gitakup: 027XY025NV  
 Inclusion 1: none  
 Inclusion 2: 027XY016NV  
 Inclusion 3: 027XY005NV

### **1495--Slaw-Cirac-Kawich association**

#### **Composition**

##### **Major Components**

Slaw silt loam, 0 to 2 percent slopes--45 percent  
 Cirac fine sandy loam, 0 to 2 percent slopes--20 percent  
 Kawich fine sand, 8 to 30 percent slopes--20 percent  
**Contrasting Inclusions**  
 Inclusion 1: Playas--10 percent  
 Inclusion 2: Typic Torriorthents, coarse-loamy, mixed (calcareous), mesic sandy loam, 0 to 2 percent slopes--5 percent

#### **Map Unit Setting**

*Landscape position:* Bolsons  
 Slaw--Landform: Alluvial flats; position on slope: lower  
 Cirac--Landform: Alluvial flats  
 Kawich--Landform: Dunes  
 Inclusion 1--Landform: Playas  
 Inclusion 2--Landform: Alluvial flats; position on slope: upper

#### **Major Component Description**

##### **Slaw Series**

*Elevation:* 4,100 to 4,900 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Cirac Series**

*Elevation:* 4,100 to 4,900 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Kawich Series**

*Elevation:* 4,100 to 4,900 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

***Dominant Present Vegetation***

Slaw: Black greasewood  
 Cirac: Black greasewood  
 Kawich: Indian ricegrass, black greasewood  
 Inclusion 1: None  
 Inclusion 2: Bailey greasewood, Cooper wolfberry

***Ecological Site***

Slaw: 029XY076NV  
 Cirac: 029XY076NV  
 Kawich: 029XY018NV  
 Inclusion 1: none  
 Inclusion 2: 029XY087NV

**1510--Isolde-Hawsley association*****Composition*****Major Components**

Isolde fine sand, 4 to 15 percent slopes--55 percent  
 Hawsley loamy sand, 2 to 4 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Bluewing gravelly loamy sand, 2 to 4 percent slopes--5 percent  
 Inclusion 2: Typic Torriorthents, sandy, mixed, mesic gravelly loamy sand, 2 to 4 percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Bolsons  
 Isolde--Landform: Dunes  
 Hawsley--Landform: Sand sheets  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Sand sheets

***Major Component Description*****Isolde Series**

*Elevation:* 4,800 to 5,400 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

**Hawsley Series**

*Elevation:* 4,800 to 5,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

***Dominant Present Vegetation***

Isolde: Indian ricegrass  
 Hawsley: Bailey greasewood, Indian ricegrass, littleleaf horsebrush  
 Inclusion 1: Bailey greasewood, Indian ricegrass, burrobrush  
 Inclusion 2: Bailey greasewood, Indian ricegrass

***Ecological Site***

Isolde: 027XY023NV  
 Hawsley: 027XY009NV  
 Inclusion 1: 027XY022NV  
 Inclusion 2: 027XY009NV

**1520--Rustigate loam, 0 to 2 percent slopes*****Composition*****Major Components**

Rustigate loam, 0 to 2 percent slopes--90 percent

**Contrasting Inclusions**

Inclusion 1: Typic Haplaquolls sandy loam, 0 to 2 percent slopes--4 percent  
 Inclusion 2: Xerollic Camborthids, loamy-skeletal, mixed, mesic sandy loam, 2 to 4 percent slopes--4 percent  
 Inclusion 3: Typic Halaquepts, fine-silty, mixed, mesic sandy loam, 0 to 2 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Bolsons  
 Rustigate--Landform: Stream terraces  
 Inclusion 1--Landform: Stream terraces  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Stream terraces

***Major Component Description*****Rustigate Series**

*Elevation:* 6,000 to 6,300 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loam  
*Drainage class:* Somewhat poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Rustigate: Black greasewood, rubber rabbitbrush  
 Inclusion 1: Inland saltgrass  
 Inclusion 2: Wyoming big sagebrush, spiny hopsage  
 Inclusion 3: Alkali sacaton, winterfat

***Ecological Site***

Rustigate: 028BY004NV  
 Inclusion 1: 028BY002NV  
 Inclusion 2: 028BY052NV  
 Inclusion 3: 028BY002NV

## 1530--Rebel sandy loam, 0 to 2 percent slopes

### *Composition*

#### **Major Components**

Rebel sandy loam, 0 to 2 percent slopes--85 percent

#### **Contrasting Inclusions**

Inclusion 1: Fluventic Haploxerolls, 0 to 2 percent slopes--9 percent

Inclusion 2: Rustigate sandy loam, cool, 0 to 2 percent slopes--3 percent

Inclusion 3: Xerollic Camborthids, loamy-skeletal, mixed, mesic sandy loam, 2 to 4 percent slopes--2 percent

Inclusion 4: Xeric Torriorthents, sandy-skeletal, mixed, mesic fine sandy loam, 0 to 2 percent slopes--1 percent

### *Map Unit Setting*

*Landscape position:* Bolsons

Rebel--Landform: Stream terraces

Inclusion 1--Landform: Channels

Inclusion 2--Landform: Stream terraces

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Channels; position on slope: upper

### *Major Component Description*

#### **Rebel Series**

*Elevation:* 6,300 to 6,700 feet

*Precipitation:* About 9 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### *Dominant Present Vegetation*

Rebel: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 1: Basin big sagebrush, basin wildrye

Inclusion 2: Black greasewood, rubber rabbitbrush

Inclusion 3: Indian ricegrass, Wyoming big sagebrush

Inclusion 4: Basin big sagebrush, basin wildrye

### *Ecological Site*

Rebel: 028BY045NV

Inclusion 1: 028BY003NV

Inclusion 2: 028BY004NV

Inclusion 3: 028BY045NV

Inclusion 4: 028BY003NV

## 1540--Packer-Suak-Foxvire association

### *Composition*

#### **Major Components**

Packer very gravelly loam, 15 to 50 percent slopes--40 percent

Suak very stony loam, 15 to 30 percent slopes--35 percent

Foxvire gravelly loam, 30 to 75 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Lithic Cryoborolls gravelly loam--4 percent

Inclusion 2: Squawtip very stony loam, 15 to 30 percent slopes--3 percent

Inclusion 3: Rock outcrop, 15 to 50 percent slopes--3 percent

### *Map Unit Setting*

*Landscape position:* Mountains

Packer--Landform: Mountains; geomorphic position: backslope

Suak--Landform: Mountains; geomorphic position: backslope; aspect: north

Foxvire--Landform: Mountains; geomorphic position: backslope

Inclusion 1--Landform: Ridges

Inclusion 2--Landform: Mountains; position on slope: lower

Inclusion 3--Landform: Mountains

### *Major Component Description*

#### **Packer Series**

*Elevation:* 8,000 to 9,400 feet

*Precipitation:* About 15 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 70 days

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Suak Series**

*Elevation:* 8,000 to 9,400 feet

*Precipitation:* About 14 inches

*Air temperature:* About 42 degrees

*Frost-free season:* About 80 days

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Foxvire Series**

*Elevation:* 8,000 to 9,400 feet

*Precipitation:* About 15 inches

*Air temperature:* About 43 degrees

*Frost-free season:* About 80 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### *Dominant Present Vegetation*

Packer: Letterman needlegrass, muttongrass

Suak: Mountain big sagebrush, needlegrass

Foxvire: Letterman needlegrass

Inclusion 1: Utah juniper, mountain big sagebrush, singleleaf pinyon

Inclusion 2: Mountain big sagebrush, singleleaf pinyon

Inclusion 3: None

**Ecological Site**

Packer: 029XY052NV  
 Suak: 029XY027NV  
 Foxvire: 029XY051NV  
 Inclusion 1: 029XY066NV  
 Inclusion 2: 029XY066NV  
 Inclusion 3: none

**1551--Sevenmile fine sandy loam, 0 to 2 percent slopes**

**Composition**

**Major Components**

Sevenmile fine sandy loam, 0 to 2 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Fluventic Haploxerolls, loamy-skeletal, mixed, mesic sandy loam, 0 to 4 percent slopes--5 percent  
 Inclusion 2: Veet gravelly sandy loam, 0 to 8 percent slopes--5 percent  
 Inclusion 3: Xeric Torriorthents, coarse-silty, mixed (calcareous), mesic sandy loam, 0 to 4 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Sevenmile--Landform: Inset fans  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Inset fans; position on slope: lower

**Major Component Description**

**Sevenmile Series**

*Elevation:* 6,300 to 6,700 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Inclusion 1: Basin big sagebrush  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Winterfat

**Ecological Site**

Sevenmile: 029XY114NV  
 Inclusion 1: 029XY003NV  
 Inclusion 2: 029XY049NV  
 Inclusion 3: 029XY020NV

**1552--Sevenmile-Mosida-Rebel association**

**Composition**

**Major Components**

Sevenmile gravelly loam, 0 to 8 percent slopes--35 percent  
 Mosida loam, 0 to 4 percent slopes--30 percent  
 Rebel very fine sandy loam, 0 to 4 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Aquolls, 0 to 4 percent slopes--7 percent  
 Inclusion 2: Kelk sandy loam, 0 to 4 percent slopes--6 percent  
 Inclusion 3: Linoyer sandy loam, 0 to 4 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Bolsons  
 Sevenmile--Landform: Inset fans  
 Mosida--Landform: Stream terraces; position on slope: lower  
 Rebel--Landform: Stream terraces; position on slope: upper  
 Inclusion 1--Landform: Stream terraces  
 Inclusion 2--Landform: Alluvial flats  
 Inclusion 3--Landform: Inset fans

**Major Component Description**

**Sevenmile Series**

*Elevation:* 7,000 to 7,400 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Mosida Series**

*Elevation:* 7,000 to 7,400 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Rebel Series**

*Elevation:* 7,000 to 7,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Sevenmile: Basin big sagebrush, basin wildrye  
 Mosida: Basin big sagebrush

Rebel: Wyoming big sagebrush  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Wyoming big sagebrush, black greasewood  
 Inclusion 3: Winterfat

***Ecological Site***

Sevenmile: 028BY003NV  
 Mosida: 028BY003NV  
 Rebel: 028BY045NV  
 Inclusion 1: 029XY081NV  
 Inclusion 2: 028BY028NV  
 Inclusion 3: 028BY013NV

**1553--Sevenmile gravelly loam, 2 to 8 percent slopes**

***Composition***

**Major Components**  
 Sevenmile gravelly loam, 2 to 8 percent slopes--90 percent

**Contrasting Inclusions**  
 Inclusion 1: Aquolls, 2 to 15 percent slopes--7 percent  
 Inclusion 2: Kelk sandy loam, 2 to 4 percent slopes--3 percent

***Map Unit Setting***

*Landscape position:* Bolsons  
 Sevenmile--Landform: Inset fans  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Stream terraces

***Major Component Description***

**Sevenmile Series**  
*Elevation:* 7,000 to 7,400 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Sevenmile: Basin big sagebrush, basin wildrye  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Wyoming big sagebrush, black greasewood

***Ecological Site***

Sevenmile: 029XY003NV  
 Inclusion 1: 028BY081NV  
 Inclusion 2: 028BY028NV

**1580--Kyler very gravelly fine sandy loam, 15 to 50 percent slopes**

***Composition***

**Major Components**  
 Kyler very gravelly fine sandy loam, 15 to 50 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--10 percent  
 Inclusion 2: Lithic Xeric Torriorthents, loamy-skeletal, carbonatic, mesic extremely stony loam, 15 to 50 percent slopes--3 percent  
 Inclusion 3: Logring very stony sandy loam, 15 to 50 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Mountains  
 Kyler--Landform: Mountains; geomorphic position: backslope  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Mountains  
 Inclusion 3--Landform: Mountains; aspect: north

***Major Component Description***

**Kyler Series**  
*Elevation:* 6,000 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from limestone and dolomite

***Dominant Present Vegetation***

Kyler: Indian ricegrass, Stansbury cliffrose, black sagebrush, galleta  
 Inclusion 1: None  
 Inclusion 2: Black sagebrush, littleleaf mountainmahogany  
 Inclusion 3: Utah juniper, singleleaf pinyon

***Ecological Site***

Kyler: 029XY014NV  
 Inclusion 1: none  
 Inclusion 2: 029XY040NV  
 Inclusion 3: 029XY069NV

**1620--Vinini-Stewval-Gabbvally association**

***Composition***

**Major Components**  
 Vinini very stony fine sandy loam, 2 to 15 percent slopes--60 percent  
 Stewval very stony fine sandy loam, 15 to 50 percent slopes--15 percent  
 Gabbvally very stony loam, 30 to 50 percent slopes--10 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--6 percent  
 Inclusion 2: Zadvar very gravelly loamy sand, 4 to 15 percent slopes--4 percent  
 Inclusion 3: Garhill very gravelly sandy loam, 15 to 30 percent slopes--3 percent

Inclusion 4: Izo very cobbly loam, 2 to 8 percent slopes--2 percent

### **Map Unit Setting**

*Landscape position:* Plateaus

Vinini--Landform: Plateaus; geomorphic position: summit

Stewval--Landform: Plateaus; geomorphic position: backslope

Gabbvally--Landform: Plateaus; geomorphic position: backslope; aspect: north

Inclusion 1--Landform: Ridges

Inclusion 2--Landform: Fan remnants

Inclusion 3--Landform: Plateaus; geomorphic position: shoulder

Inclusion 4--Landform: Drainageways

### **Major Component Description**

#### **Vinini Series**

*Elevation:* 5,500 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 3 percent stones and boulders; 20 percent cobbles; 45 percent gravel

*Surface layer texture:* Very stony fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Stewval Series**

*Elevation:* 5,500 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 51 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent stones and boulders; 10 percent cobbles; 35 percent gravel

*Surface layer texture:* Very stony fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Gabbvally Series**

*Elevation:* 5,800 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent stones and boulders; 10 percent cobbles; 25 percent gravel

*Surface layer texture:* Very stony loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### **Dominant Present Vegetation**

Vinini: Black sagebrush, bottlebrush squirreltail, galleta

Stewval: Black sagebrush, bottlebrush squirreltail, galleta

Gabbvally: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 1: None

Inclusion 2: Black sagebrush, galleta

Inclusion 3: Galleta, shadscale

Inclusion 4: Burrobrush

### **Ecological Site**

Vinini: 029XY008NV

Stewval: 029XY008NV

Gabbvally: 029XY010NV

Inclusion 1: none

Inclusion 2: 029XY008NV

Inclusion 3: 029XY022NV

Inclusion 4: 029XY041NV

## **1621--Vinini-Beelem-Gabbvally association**

### **Composition**

#### **Major Components**

Vinini very stony fine sandy loam, 2 to 15 percent slopes--45 percent

Beelem cobbly sandy loam, 15 to 50 percent slopes--25 percent

Gabbvally very stony loam, 8 to 50 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--10 percent

Inclusion 2: Downeyville very cobbly sandy loam, 2 to 30 percent slopes--5 percent

### **Map Unit Setting**

*Landscape position:* Plateaus

Vinini--Landform: Plateaus; geomorphic position: summit

Beelem--Landform: Hills; geomorphic position: backslope

Gabbvally--Landform: Plateaus; geomorphic position: backslope

Inclusion 1--Landform: Ridges

Inclusion 2--Landform: Plateaus

### **Major Component Description**

#### **Vinini Series**

*Elevation:* 7,000 to 8,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 20 percent cobbles; 45 percent gravel

*Surface layer texture:* Very stony fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Beelem Series**

*Elevation:* 7,000 to 8,500 feet

*Precipitation:* About 10 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 15 percent cobbles; 45 percent gravel

*Surface layer texture:* Cobbly sandy loam

*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from tuffaceous rocks

#### **Gabbvally Series**

*Elevation:* 7,000 to 8,500 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent stones and boulders; 10 percent cobbles; 25 percent gravel  
*Surface layer texture:* Very stony loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Vinini: Black sagebrush, bottlebrush squirreltail, galleta  
 Beelem: Utah juniper, black sagebrush, singleleaf pinyon  
 Gabbvally: Wyoming big sagebrush  
 Inclusion 1: None  
 Inclusion 2: Galleta, shadscale

#### ***Ecological Site***

Vinini: 029XY008NV  
 Beelem: 029XY081NV  
 Gabbvally: 029XY010NV  
 Inclusion 1: none  
 Inclusion 2: 029XY022NV

### **1631--Lyx-Veet association**

#### ***Composition***

##### **Major Components**

Lyx gravelly loamy sand, 2 to 8 percent slopes--60 percent  
 Veet very gravelly sandy loam, 2 to 8 percent slopes--35 percent

##### **Contrasting Inclusions**

Inclusion 1: Unsel gravelly sandy loam, 2 to 4 percent slopes--3 percent  
 Inclusion 2: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic very gravelly loam, 2 to 4 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Lyx--Landform: Alluvial fans  
 Veet--Landform: Inset fans; position on slope: upper  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Alluvial fans; position on slope: upper

#### ***Major Component Description***

##### **Lyx Series**

*Elevation:* 5,800 to 6,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days

*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Veet Series**

*Elevation:* 5,800 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 35 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Lyx: Douglas rabbitbrush, fourwing saltbush, galleta  
 Veet: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 1: Bud sagebrush, galleta, shadscale  
 Inclusion 2: Big sagebrush

#### ***Ecological Site***

Lyx: 029XY046NV  
 Veet: 029XY049NV  
 Inclusion 1: 029XY017NV  
 Inclusion 2: 029XY009NV

### **1648--Armespan-Whilphang-Wrango association**

#### ***Composition***

##### **Major Components**

Armespan very gravelly sandy loam, 2 to 8 percent slopes--40 percent  
 Whilphang very gravelly sandy loam, 8 to 30 percent slopes--25 percent  
 Wrango very gravelly loamy sand, 2 to 8 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Tert loam, 8 to 30 percent slopes--6 percent  
 Inclusion 2: Sevenmile gravelly sandy loam, 2 to 4 percent slopes--6 percent  
 Inclusion 3: Xeric Torrifluvents, loamy-skeletal, mixed (calcareous), mesic very gravelly loam, 2 to 8 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Armespan--Landform: Fan remnants  
 Whilphang--Landform: Pediments  
 Wrango--Landform: Inset fans  
 Inclusion 1--Landform: Pediments  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Channels

**Major Component Description****Armespan Series***Elevation:* 5,600 to 6,200 feet*Precipitation:* About 10 inches*Air temperature:* About 53 degrees*Frost-free season:* About 120 days*Surface rock fragments:* 50 percent gravel*Surface layer texture:* Very gravelly sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks**Whilphang Series***Elevation:* 5,600 to 6,200 feet*Precipitation:* About 9 inches*Air temperature:* About 53 degrees*Frost-free season:* About 120 days*Surface rock fragments:* 45 percent gravel*Surface layer texture:* Very gravelly sandy loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from lacustrine sediments**Wrango Series***Elevation:* 5,600 to 6,200 feet*Precipitation:* About 10 inches*Air temperature:* About 52 degrees*Frost-free season:* About 120 days*Surface rock fragments:* 60 percent gravel*Surface layer texture:* Very gravelly loamy sand*Drainage class:* Excessively drained*Dominant parent material:* Alluvium derived from mixed rocks**Dominant Present Vegetation**

Armespan: Nevada ephedra, black sagebrush, bottlebrush squirreltail, galleta

Whilphang: Nevada ephedra, black sagebrush, galleta

Wrango: Indian ricegrass, Nevada ephedra, black sagebrush, spiny hopsage

Inclusion 1: Utah juniper, black sagebrush

Inclusion 2: Wyoming big sagebrush

Inclusion 3: Big sagebrush

**Ecological Site**

Armespan: 029XY008NV

Whilphang: 029XY008NV

Wrango: 028BY011NV

Inclusion 1: 029XY081NV

Inclusion 2: 029XY114NV

Inclusion 3: 029XY009NV

**1660--Minnye-Annaw-Wardenot association****Composition****Major Components**

Minnye very gravelly sandy loam, 2 to 8 percent slopes--55 percent

Annaw very gravelly loamy sand, 2 to 8 percent slopes--15 percent

Wardenot very gravelly loamy sand, 2 to 8 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Izo very gravelly loamy sand, 2 to 4 percent slopes--9 percent

Inclusion 2: Cliffdown very gravelly loamy sand, 2 to 4 percent slopes--4 percent

Inclusion 3: Stumble loamy sand, 2 to 4 percent slopes--2 percent

**Map Unit Setting***Landscape position:* Fan piedmonts

Minnye--Landform: Fan remnants

Annaw--Landform: Inset fans; position on slope: upper

Wardenot--Landform: Inset fans

Inclusion 1--Landform: Channels

Inclusion 2--Landform: Inset fans; position on slope: lower

Inclusion 3--Landform: Sand sheets

**Major Component Description****Minnye Series***Elevation:* 4,700 to 5,500 feet*Precipitation:* About 6 inches*Air temperature:* About 53 degrees*Frost-free season:* About 130 days*Surface rock fragments:* 10 percent cobbles; 45 percent gravel*Surface layer texture:* Very gravelly sandy loam*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks**Annaw Series***Elevation:* 4,700 to 5,500 feet*Precipitation:* About 7 inches*Air temperature:* About 53 degrees*Frost-free season:* About 130 days*Surface rock fragments:* 5 percent cobbles; 40 percent gravel*Surface layer texture:* Very gravelly loamy sand*Drainage class:* Well drained*Dominant parent material:* Alluvium derived from mixed rocks**Wardenot Series***Elevation:* 4,700 to 5,500 feet*Precipitation:* About 5 inches*Air temperature:* About 53 degrees*Frost-free season:* About 130 days*Surface rock fragments:* 5 percent cobbles; 55 percent gravel*Surface layer texture:* Very gravelly loamy sand*Drainage class:* Excessively drained*Dominant parent material:* Alluvium derived from mixed rocks**Dominant Present Vegetation**

Minnye: Bailey greasewood, bud sagebrush, galleta, shadscale, spiny menodora

Annaw: Bailey greasewood, bud sagebrush, galleta, spiny menodora

Wardenot: Bailey greasewood, shadscale

Inclusion 1: Bailey greasewood, Indian ricegrass, burrobrush, shadscale

Inclusion 2: Indian ricegrass, bud sagebrush

Inclusion 3: Indian ricegrass, fourwing saltbush

#### ***Ecological Site***

Minnye: 029XY036NV

Annaw: 029XY087NV

Wardenot: 029XY087NV

Inclusion 1: 029XY041NV

Inclusion 2: 029XY042NV

Inclusion 3: 029XY012NV

### **1661--Minnye-Cliffdown-Lyx association**

#### ***Composition***

##### **Major Components**

Minnye very cobbly fine sandy loam, 2 to 8 percent slopes--45 percent

Cliffdown gravelly sandy loam, 2 to 8 percent slopes--25 percent

Lyx gravelly loamy sand, 2 to 8 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Izo very gravelly loamy sand, 2 to 8 percent slopes--5 percent

Inclusion 2: Goldyke gravelly sandy loam, dry, 4 to 8 percent slopes--3 percent

Inclusion 3: Leo very cobbly sandy loam, 2 to 15 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Minnye--Landform: Fan remnants

Cliffdown--Landform: Inset fans; position on slope: lower

Lyx--Landform: Inset fans

Inclusion 1--Landform: Channels

Inclusion 2--Landform: Pediments

Inclusion 3--Landform: Inset fans; position on slope: upper

#### ***Major Component Description***

##### **Minnye Series**

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 35 percent cobbles; 25 percent gravel

*Surface layer texture:* Very cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Cliffdown Series**

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Lyx Series**

*Elevation:* 5,000 to 5,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 35 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Minnye: Bailey greasewood, galleta, spiny hopsage

Cliffdown: Fourwing saltbush, galleta, winterfat

Lyx: Fourwing saltbush, galleta

Inclusion 1: Bailey greasewood, burrobrush

Inclusion 2: Bailey greasewood, Indian ricegrass, galleta, shadscale

Inclusion 3: Spiny hopsage

#### ***Ecological Site***

Minnye: 029XY087NV

Cliffdown: 029XY042NV

Lyx: 029XY046NV

Inclusion 1: 029XY041NV

Inclusion 2: 029XY022NV

Inclusion 3: 029XY016NV

### **1670--Logring-Kyler association**

#### ***Composition***

##### **Major Components**

Logring very cobbly fine sandy loam, 30 to 75 percent slopes--60 percent

Kyler extremely cobbly loam, 8 to 30 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--10 percent

Inclusion 2: Xerollic Haplargids, loamy-skeletal, mixed, mesic gravelly sandy loam, 8 to 30 percent slopes--3 percent

Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic fine sandy loam, 2 to 8 percent slopes--1 percent

Inclusion 4: Cryic Rendolls, loamy-skeletal, carbonatic, 30 to 75 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Mountains

Logring--Landform: Mountains; geomorphic position: backslope

Kyler--Landform: Mountains; geomorphic position: backslope; position on slope: lower; aspect: south

Inclusion 1--Landform: Ridges

Inclusion 2--Landform: Mountains; geomorphic position: toeslope

Inclusion 3--Landform: Drainageways

Inclusion 4--Landform: Mountains; position on slope: upper

**Major Component Description****Logring Series**

*Elevation:* 6,600 to 7,800 feet

*Precipitation:* About 12 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 25 percent cobbles; 30 percent gravel

*Surface layer texture:* Very cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from limestone and dolomite

**Kyler Series**

*Elevation:* 6,500 to 7,800 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 30 percent cobbles; 45 percent gravel

*Surface layer texture:* Extremely cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from limestone and dolomite

**Dominant Present Vegetation**

Logring: Utah juniper, black sagebrush, singleleaf pinyon

Kyler: Black sagebrush, bottlebrush squirreltail

Inclusion 1: None

Inclusion 2: Wyoming big sagebrush

Inclusion 3: Basin big sagebrush

Inclusion 4: Mountain big sagebrush

**Ecological Site**

Logring: 029XY069NV

Kyler: 029XY014NV

Inclusion 1: none

Inclusion 2: 029XY010NV

Inclusion 3: 029XY009NV

Inclusion 4: 029XY051NV

**1680--Uripnes-Rock outcrop association****Composition****Major Components**

Uripnes very stony sandy loam, 30 to 75 percent slopes--50 percent

Rock outcrop unweathered bedrock, 15 to 99 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Budihol very stony sandy loam, 30 to 75 percent slopes--10 percent

Inclusion 2: Singatse very cobbly sandy loam, 30 to 50 percent slopes--3 percent

Inclusion 3: Bluewing very gravelly loamy sand, 4 to 15 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Mountains

Uripnes--Landform: Mountains; geomorphic position: backslope

Rock outcrop--Landform: Mountains; position on slope: areas of exposed rock

Inclusion 1--Landform: Mountains

Inclusion 2--Landform: Mountains; position on slope: lower

Inclusion 3--Landform: Drainageways

**Major Component Description****Uripnes Series**

*Elevation:* 5,200 to 6,500 feet

*Precipitation:* About 6 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 110 days

*Surface rock fragments:* 10 percent stones and boulders; 20 percent cobbles; 20 percent gravel

*Surface layer texture:* Very stony sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from granitic rocks

**Rock outcrop Miscellaneous Area**

*Surface rock fragments:* 6,500 percent stones and boulders; *Surface layer texture:* Unweathered bedrock

**Dominant Present Vegetation**

Uripnes: Indian ricegrass, desert needlegrass, littleleaf horsebrush

Rock outcrop: None

Inclusion 1: Wyoming big sagebrush

Inclusion 2: Bailey greasewood, shadscale

Inclusion 3: Bailey greasewood, burrobrush, shadscale

**Ecological Site**

Uripnes: 027XY047NV

Rock outcrop: None

Inclusion 1: 027XY007NV

Inclusion 2: 027XY027NV

Inclusion 3: 027XY022NV

### 1681--Uripnes-Budihol-Rock outcrop association

#### *Composition*

#### **Major Components**

Uripnes extremely bouldery sandy loam, 30 to 75 percent slopes--35 percent  
 Budihol extremely bouldery sandy loam, 30 to 75 percent slopes--35 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Rubble land--10 percent  
 Inclusion 2: Typic Torriorthents, sandy, mixed, mesic loamy sand, 4 to 15 percent slopes--5 percent

#### *Map Unit Setting*

*Landscape position:* Mountains  
 Uripnes--Landform: Mountains; geomorphic position: backslope  
 Budihol--Landform: Mountains; aspect: north  
 Rock outcrop--Landform: Mountains; position on slope: areas of exposed rock  
 Inclusion 1--Landform: Mountains  
 Inclusion 2--Landform: Drainageways

#### *Major Component Description*

#### **Uripnes Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Extremely bouldery sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum derived from granitic rocks

#### **Budihol Series**

*Elevation:* 5,800 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 100 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Extremely bouldery sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from granitic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,800 to 7,000 feet  
*Surface layer texture:* Unweathered bedrock

#### *Dominant Present Vegetation*

Uripnes: Desert needlegrass, spiny hopsage  
 Budihol: Sandberg bluegrass, Wyoming big sagebrush  
 Rock outcrop: None  
 Inclusion 1: None  
 Inclusion 2: Bailey greasewood, Indian ricegrass, littleleaf horsebrush

#### *Ecological Site*

Uripnes: 027XY047NV  
 Budihol: 027XY007NV  
 Rock outcrop: None  
 Inclusion 1: none  
 Inclusion 2: 027XY009NV

### 1691--Goldyke-Blacktop-Koyen association

#### *Composition*

#### **Major Components**

Goldyke gravelly sandy loam, 8 to 30 percent slopes--55 percent  
 Blacktop very gravelly sandy loam, 30 to 75 percent slopes--20 percent  
 Koyen fine sandy loam, 2 to 8 percent slopes--10 percent

#### **Contrasting Inclusions**

Inclusion 1: Unsel gravelly sandy loam, dry, 8 to 30 percent slopes--7 percent  
 Inclusion 2: Rock outcrop--6 percent  
 Inclusion 3: Xeric Torriorthents very gravelly loamy sand, 2 to 8 percent slopes--2 percent

#### *Map Unit Setting*

*Landscape position:* Hills and intermontane basins  
 Goldyke--Landform: Hills; geomorphic position: backslope  
 Blacktop--Landform: Hills  
 Koyen--Landform: Inset fans  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Ridges  
 Inclusion 3--Landform: Drainageways

#### *Major Component Description*

#### **Goldyke Series**

*Elevation:* 4,500 to 5,700 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Blacktop Series**

*Elevation:* 4,500 to 5,700 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Koyen Series**

*Elevation:* 4,500 to 5,700 feet

*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Goldyke: Bailey greasewood, Indian ricegrass, galleta, shadscale  
 Blacktop: Bailey greasewood, shadscale  
 Koyen: Indian ricegrass, galleta, spiny hopsage  
 Inclusion 1: Bailey greasewood, galleta, shadscale  
 Inclusion 2: None  
 Inclusion 3: Wyoming big sagebrush

#### ***Ecological Site***

Goldyke: 029XY022NV  
 Blacktop: 029XY033NV  
 Koyen: 029XY046NV  
 Inclusion 1: 029XY087NV  
 Inclusion 2: none  
 Inclusion 3: 029XY009NV

### **1704--Leo-Izo association**

#### ***Composition***

##### **Major Components**

Leo gravelly sandy loam, 2 to 4 percent slopes--55 percent  
 Izo very gravelly sand, 2 to 4 percent slopes--30 percent

##### **Contrasting Inclusions**

Inclusion 1: Typic Torriorthents very gravelly sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Lyx very gravelly sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 4 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Leo--Landform: Inset fans  
 Izo--Landform: Drainageways  
 Inclusion 1--Landform: Inset fans; position on slope: lower  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Channels

#### ***Major Component Description***

##### **Leo Series**

*Elevation:* 4,600 to 5,500 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Izo Series**

*Elevation:* 4,600 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Very gravelly sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Leo: Indian ricegrass  
 Izo: Burrobrush, shadscale  
 Inclusion 1: Bailey greasewood, bud sagebrush, shadscale  
 Inclusion 2: Galleta  
 Inclusion 3: Big sagebrush

#### ***Ecological Site***

Leo: 029XY016NV  
 Izo: 029XY041NV  
 Inclusion 1: 029XY087NV  
 Inclusion 2: 029XY046NV  
 Inclusion 3: 029XY009NV

### **1705--Leo-Unsel-Lyx association**

#### ***Composition***

##### **Major Components**

Leo gravelly sandy loam, 2 to 8 percent slopes--40 percent  
 Unsel very gravelly fine sandy loam, 2 to 8 percent slopes--25 percent  
 Lyx gravelly loamy sand, 2 to 8 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Izo very gravelly loamy sand, 2 to 8 percent slopes--7 percent  
 Inclusion 2: Cliffdown gravelly sandy loam, 2 to 4 percent slopes--4 percent  
 Inclusion 3: Haplic Durargids, clayey, montmorillonitic, mesic, shallow very gravelly sandy loam, 2 to 8 percent slopes--4 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Leo--Landform: Inset fans  
 Unsel--Landform: Fan remnants  
 Lyx--Landform: Inset fans; position on slope: lower  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Fan remnants; position on slope: upper

**Major Component Description****Leo Series**

*Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Unsel Series**

*Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Lyx Series**

*Elevation:* 5,600 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Leo: Bailey greasewood, galleta, spiny hopsage  
 Unsel: Bud sagebrush, galleta, shadscale  
 Lyx: Fourwing saltbush, galleta  
 Inclusion 1: Burrobrush  
 Inclusion 2: Bottlebrush squirreltail, bud sagebrush, winterfat  
 Inclusion 3: Bailey greasewood, galleta, shadscale

**Ecological Site**

Leo: 029XY016NV  
 Unsel: 029XY017NV  
 Lyx: 029XY046NV  
 Inclusion 1: 029XY041NV  
 Inclusion 2: 029XY042NV  
 Inclusion 3: 029XY087NV

**1706--Leo-Zadvar association****Composition**

**Major Components**  
 Leo very gravelly sandy loam, 2 to 8 percent slopes--45 percent  
 Zadvar very gravelly sandy loam, 4 to 30 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Unsel very gravelly fine sandy loam, 2 to 8 percent slopes--10 percent  
 Inclusion 2: Lyx very gravelly loamy sand, 2 to 8 percent slopes--3 percent  
 Inclusion 3: Rock outcrop--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Leo--Landform: Inset fans  
 Zadvar--Landform: Fan remnants  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Pediments; geomorphic position: backslope

**Major Component Description****Leo Series**

*Elevation:* 6,400 to 7,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Zadvar Series**

*Elevation:* 6,400 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

**Dominant Present Vegetation**

Leo: Indian ricegrass, fourwing saltbush, galleta, spiny hopsage  
 Zadvar: Black sagebrush, galleta  
 Inclusion 1: Bailey greasewood, galleta, shadscale  
 Inclusion 2: Fourwing saltbush, galleta  
 Inclusion 3: None

**Ecological Site**

Leo: 029XY016NV  
 Zadvar: 029XY008NV  
 Inclusion 1: 029XY087NV  
 Inclusion 2: 029XY046NV  
 Inclusion 3: none

**1741--Keefa-Koyen association****Composition****Major Components**

Keefa sandy loam, 2 to 4 percent slopes--45 percent

Koyen sandy loam, 2 to 4 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Stumble fine sandy loam, 2 to 4 percent slopes--8 percent

Inclusion 2: Unsel gravelly fine sandy loam, 2 to 4 percent slopes--5 percent

Inclusion 3: Xeric Torriorthents very gravelly sandy loam, 0 to 2 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Keefa--Landform: Inset fans

Koyen--Landform: Inset fans; position on slope: lower

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Fan remnants

Inclusion 3--Landform: Channels

**Major Component Description****Keefa Series**

*Elevation:* 4,800 to 5,800 feet

*Precipitation:* About 6 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Koyen Series**

*Elevation:* 4,800 to 5,800 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Keefa: Bud sagebrush, galleta, shadscale

Koyen: Fourwing saltbush, galleta

Inclusion 1: Indian ricegrass, fourwing saltbush

Inclusion 2: Bud sagebrush, shadscale

Inclusion 3: Wyoming big sagebrush, basin big sagebrush

**Ecological Site**

Keefa: 029XY017NV

Koyen: 029XY046NV

Inclusion 1: 029XY012NV

Inclusion 2: 029XY017NV

Inclusion 3: 029XY009NV

**1751--Koyen-Unsel association****Composition****Major Components**

Koyen gravelly sandy loam, 0 to 8 percent slopes--40 percent

Unsel gravelly sandy loam, 0 to 8 percent slopes--30 percent

Koyen gravelly sandy loam, 0 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Veet gravelly sandy loam, 2 to 8 percent slopes--4 percent

Inclusion 2: Geer gravelly sandy loam, 0 to 4 percent slopes--4 percent

Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sand, 0 to 4 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Koyen--Landform: Inset fans

Unsel--Landform: Fan remnants

Koyen--Landform: Inset fans; position on slope: upper

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Inset fans; position on slope: lower

Inclusion 3--Landform: Channels

**Major Component Description****Koyen Series**

*Elevation:* 5,400 to 6,200 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 20 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Unsel Series**

*Elevation:* 5,400 to 6,200 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Koyen Series**

*Elevation:* 5,400 to 6,200 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 20 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Dominant Present Vegetation**

Koyen: Fourwing saltbush, galleta  
 Unsel: Indian ricegrass, bud sagebrush, galleta, shadscale  
 Koyen: Galleta, rabbitbrush, spiny hopsage  
 Inclusion 1: Indian ricegrass, Wyoming big sagebrush, spiny hopsage  
 Inclusion 2: Bud sagebrush, galleta, winterfat  
 Inclusion 3: Big sagebrush

#### **Ecological Site**

Koyen: 029XY046NV  
 Unsel: 029XY017NV  
 Koyen: 029XY016NV  
 Inclusion 1: 029XY049NV  
 Inclusion 2: 029XY042NV  
 Inclusion 3: 029XY009NV

### **1753--Koyen-Stumble association**

#### **Composition**

##### **Major Components**

Koyen sandy loam, 2 to 8 percent slopes--45 percent  
 Stumble loamy sand, 0 to 4 percent slopes--20 percent  
 Koyen sand, 2 to 8 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Unsel gravelly fine sandy loam, 2 to 8 percent slopes--7 percent  
 Inclusion 2: Izo very gravelly sand, 0 to 4 percent slopes--4 percent  
 Inclusion 3: Keefa sandy loam, 2 to 8 percent slopes--4 percent

#### **Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Koyen--Landform: Inset fans; position on slope: lower  
 Stumble--Landform: Inset fans; position on slope: upper  
 Koyen--Landform: Inset fans  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Channels  
 Inclusion 3--Landform: Fan remnants; position on slope: lower

#### **Major Component Description**

##### **Koyen Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Stumble Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Koyen Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Sand  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Dominant Present Vegetation**

Koyen: Fourwing saltbush, galleta  
 Stumble: Galleta, spiny hopsage  
 Koyen: Galleta, spiny hopsage  
 Inclusion 1: Bud sagebrush, galleta, shadscale  
 Inclusion 2: Burrobrush  
 Inclusion 3: Galleta, shadscale

#### **Ecological Site**

Koyen: 029XY046NV  
 Stumble: 029XY012NV  
 Koyen: 029XY016NV  
 Inclusion 1: 029XY017NV  
 Inclusion 2: 029XY041NV  
 Inclusion 3: 029XY017NV

### **1760--Vindicator gravelly sandy loam, 8 to 30 percent slopes**

#### **Composition**

##### **Major Components**

Vindicator gravelly sandy loam, 8 to 30 percent slopes--85 percent

##### **Contrasting Inclusions**

Inclusion 1: Lithic Torriorthents, sandy-skeletal, carbonatic, mesic very gravelly sandy loam, 8 to 30 percent slopes--8 percent  
 Inclusion 2: Stewval very gravelly sandy loam, 8 to 30 percent slopes--3 percent  
 Inclusion 3: Leo very gravelly loamy sand, 2 to 8 percent slopes--2 percent  
 Inclusion 4: Rock outcrop--2 percent

#### **Map Unit Setting**

*Landscape position:* Hills  
 Vindicator--Landform: Hills; geomorphic position: backslope  
 Inclusion 1--Landform: Hills  
 Inclusion 2--Landform: Hills; aspect: north  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Ridges

**Major Component Description****Vindicator Series**

*Elevation:* 4,800 to 5,800 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

Vindicator: Bailey greasewood, spiny hopsage  
 Inclusion 1: Spiny hopsage  
 Inclusion 2: Black sagebrush  
 Inclusion 3: Horsebrush, spiny hopsage  
 Inclusion 4: None

**Ecological Site**

Vindicator: 029XY021NV  
 Inclusion 1: 029XY021NV  
 Inclusion 2: 029XY008NV  
 Inclusion 3: 029XY016NV  
 Inclusion 4: none

**1790--Hooplite-Theon-Old Camp association****Composition****Major Components**

Hooplite very gravelly fine sandy loam, 15 to 50 percent slopes--40 percent  
 Theon very gravelly sandy loam, 15 to 50 percent slopes--30 percent  
 Old Camp very gravelly fine sandy loam, 15 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Singatse very gravelly sandy loam, 15 to 50 percent slopes--10 percent  
 Inclusion 2: Rock outcrop--5 percent

**Map Unit Setting**

*Landscape position:* Hills  
 Hooplite--Landform: Hills  
 Theon--Landform: Hills; aspect: south  
 Old Camp--Landform: Hills; aspect: north  
 Inclusion 1--Landform: Hills  
 Inclusion 2--Landform: Ridges

**Major Component Description****Hooplite Series**

*Elevation:* 6,000 to 7,200 feet  
*Precipitation:* About 8 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Theon Series**

*Elevation:* 5,800 to 6,600 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Old Camp Series**

*Elevation:* 6,000 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

Hooplite: Black sagebrush  
 Theon: Shadscale  
 Old Camp: Wyoming big sagebrush  
 Inclusion 1: Shadscale  
 Inclusion 2: None

**Ecological Site**

Hooplite: 027XY032NV  
 Theon: 027XY019NV  
 Old Camp: 027XY007NV  
 Inclusion 1: 027XY027NV  
 Inclusion 2: none

**1792--Hooplite-Rock outcrop association****Composition****Major Components**

Hooplite very gravelly loam, 15 to 50 percent slopes--70 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Lithic Argixerolls, loamy-skeletal, mixed, frigid very stony loam, 30 to 50 percent slopes--7 percent  
 Inclusion 2: Lithic Argixerolls, loamy-skeletal, mixed, frigid very stony loam, 30 to 75 percent slopes--5 percent  
 Inclusion 3: Lithic Haplargids, loamy-skeletal, mixed, mesic very gravelly sandy loam, 15 to 50 percent slopes--2 percent  
 Inclusion 4: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic very gravelly sandy loam, 2 to 15 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Hills

Hooplite--Landform: Hills

Rock outcrop--Landform: Hills; position on slope: areas of exposed rock

Inclusion 1--Landform: Hills; position on slope: upper

Inclusion 2--Landform: Hills; aspect: north

Inclusion 3--Landform: Hills; aspect: south

Inclusion 4--Landform: Drainageways

**Major Component Description****Hooplite Series**

*Elevation:* 6,800 to 7,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 110 days

*Surface rock fragments:* 10 percent cobbles; 45 percent gravel

*Surface layer texture:* Very gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Rock outcrop Miscellaneous Area**

*Elevation:* 6,800 to 7,400 feet

*Surface layer texture:* Unweathered bedrock

**Dominant Present Vegetation**

Hooplite: Indian ricegrass, black sagebrush, bottlebrush squirreltail

Rock outcrop: None

Inclusion 1: Black sagebrush, singleleaf pinyon

Inclusion 2: Mountain big sagebrush, singleleaf pinyon

Inclusion 3: Bud sagebrush, galleta, shadscale

**Ecological Site**

Hooplite: 028BY016NV

Rock outcrop: None

Inclusion 1: 028BY060NV

Inclusion 2: 028BY058NV

Inclusion 3: 029XY022NV

Inclusion 4: 028BY041NV

**1800--Lyda-Zadvar-Unsel association****Composition****Major Components**

Lyda very cobbly fine sandy loam, 2 to 8 percent slopes--35 percent

Zadvar very gravelly sandy loam, 4 to 30 percent slopes--30 percent

Unsel very gravelly fine sandy loam, 4 to 30 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Hollywell very gravelly fine sandy loam, 2 to 8 percent slopes--6 percent

Inclusion 2: Veet very gravelly sandy loam, 2 to 8 percent slopes--4 percent

Inclusion 3: Lyx very gravelly sandy loam, 2 to 8 percent slopes--3 percent

Inclusion 4: Cliffdown very gravelly sandy loam, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Lyda--Landform: Fan remnants

Zadvar--Landform: Fan remnants; geomorphic position: backslope

Unsel--Landform: Fan remnants; position on slope: lower

Inclusion 1--Landform: Inset fans; position on slope: upper

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Inset fans; position on slope: lower

Inclusion 4--Landform: Inset fans

**Major Component Description****Lyda Series**

*Elevation:* 5,800 to 6,800 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 35 percent cobbles; 25 percent gravel

*Surface layer texture:* Very cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Zadvar Series**

*Elevation:* 5,900 to 6,900 feet

*Precipitation:* About 9 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 50 percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from volcanic rocks

**Unsel Series**

*Elevation:* 5,700 to 6,800 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 50 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Lyda: Bailey greasewood, shadscale

Zadvar: Black sagebrush, galleta

Unsel: Bailey greasewood, bud sagebrush, galleta, shadscale

Inclusion 1: Bailey greasewood, bud sagebrush, shadscale

Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Fourwing saltbush  
 Inclusion 4: Bud sagebrush, winterfat

### ***Ecological Site***

Lyda: 029XY087NV  
 Zadvar: 029XY008NV  
 Unsel: 029XY087NV  
 Inclusion 1: 029XY087NV  
 Inclusion 2: 029XY049NV  
 Inclusion 3: 029XY046NV  
 Inclusion 4: 029XY042NV

## **1801--Lyda-Leo-Zadvar association**

### ***Composition***

#### **Major Components**

Lyda very cobbly fine sandy loam, 2 to 8 percent slopes--50 percent  
 Leo very gravelly sandy loam, 2 to 15 percent slopes--20 percent  
 Zadvar cobbly sandy loam, 4 to 30 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Univega very cobbly sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic cobbly sandy loam, 2 to 15 percent slopes--5 percent  
 Inclusion 3: Izo very stony loamy sand, 2 to 8 percent slopes--4 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Lyda--Landform: Fan remnants  
 Leo--Landform: Inset fans  
 Zadvar--Landform: Fan remnants; geomorphic position: backslope  
 Inclusion 1--Landform: Fan remnants; position on slope: lower  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Channels

### ***Major Component Description***

#### **Lyda Series**

*Elevation:* 5,800 to 6,900 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent cobbles; 25 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Leo Series**

*Elevation:* 5,800 to 6,700 feet  
*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Zadvar Series**

*Elevation:* 5,400 to 6,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 25 percent cobbles; 10 percent gravel  
*Surface layer texture:* Cobbly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from volcanic rocks

### ***Dominant Present Vegetation***

Lyda: Bailey greasewood, bud sagebrush, galleta, shadscale  
 Leo: Bailey greasewood, Indian ricegrass, spiny hopsage  
 Zadvar: Black sagebrush, galleta  
 Inclusion 1: Fourwing saltbush  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Burrobrush

### ***Ecological Site***

Lyda: 029XY017NV  
 Leo: 029XY016NV  
 Zadvar: 029XY008NV  
 Inclusion 1: 029SY046NV  
 Inclusion 2: 029XY006NV  
 Inclusion 3: 029XY041NV

## **1802--Lyda-Unsel-Koyen association**

### ***Composition***

#### **Major Components**

Lyda very gravelly fine sandy loam, 2 to 8 percent slopes--45 percent  
 Unsel gravelly fine sandy loam, 2 to 8 percent slopes--35 percent  
 Koyen sandy loam, 2 to 8 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Univega gravelly sandy loam, 2 to 85 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Lyda--Landform: Fan remnants; position on slope: upper  
 Unsel--Landform: Fan remnants; position on slope: lower  
 Koyen--Landform: Inset fans

Inclusion 1--Landform: Fan remnants; position on slope: lower

### **Major Component Description**

#### **Lyda Series**

*Elevation:* 5,800 to 6,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Unsel Series**

*Elevation:* 5,800 to 6,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Koyen Series**

*Elevation:* 5,800 to 6,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

### **Dominant Present Vegetation**

Lyda: Bud sagebrush, galleta, shadscale  
 Unsel: Douglas rabbitbrush, bud sagebrush, galleta, shadscale  
 Koyen: Fourwing saltbush, galleta  
 Inclusion 1: Fourwing saltbush, galleta

### **Ecological Site**

Lyda: 029XY017NV  
 Unsel: 029XY017NV  
 Koyen: 029XY046NV  
 Inclusion 1: 029XY046NV

## **1805--Lyda-Unsel association**

### **Composition**

#### **Major Components**

Lyda very cobbly fine sandy loam, 2 to 8 percent slopes--40 percent  
 Unsel very gravelly fine sandy loam, 2 to 8 percent slopes--25 percent  
 Inclusion 1 very gravelly fine sandy loam, 2 to 8 percent slopes--20 percent

### **Contrasting Inclusions**

Inclusion 1: Zadvar very cobbly sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 2: Leo stony sandy loam, 2 to 8 percent slopes--4 percent  
 Inclusion 3: Izo gravelly sand, 2 to 8 percent slopes--4 percent  
 Inclusion 4: Lyx very gravelly loamy sand, 2 to 8 percent slopes--2 percent

### **Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Lyda--Landform: Fan remnants; geomorphic position: summit  
 Unsel--Landform: Fan remnants  
 Unsel--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Fan remnants; position on slope: upper  
 Inclusion 2--Landform: Inset fans; position on slope: upper  
 Inclusion 3--Landform: Channels  
 Inclusion 4--Landform: Inset fans; position on slope: lower

### **Major Component Description**

#### **Lyda Series**

*Elevation:* 5,600 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent cobbles; 25 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Unsel Series**

*Elevation:* 5,600 to 6,200 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Unsel Series**

*Elevation:* 5,600 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Lyda: Bud sagebrush, galleta, shadscale  
 Unsel: Bailey greasewood, galleta, shadscale  
 Unsel: Bailey greasewood, galleta, shadscale  
 Inclusion 1: Black sagebrush, galleta  
 Inclusion 2: Galleta, horsebrush, spiny hopsage  
 Inclusion 3: Burrobrush  
 Inclusion 4: Fourwing saltbush

***Ecological Site***

Lyda: 029XY017NV  
 Unsel: 029XY087NV  
 Unsel: 029XY017NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY016NV  
 Inclusion 3: 029XY041NV  
 Inclusion 4: 029XY046NV

**1820--Izo very gravelly sand, 2 to 8 percent slopes*****Composition*****Major Components**

Izo very gravelly sand, 2 to 8 percent slopes--90 percent

**Contrasting Inclusions**

Inclusion 1: Lyx gravelly sand, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly loamy sand, 2 to 8 percent slopes--3 percent  
 Inclusion 3: Stumble fine sand, 8 to 15 percent slopes--1 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Izo--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope: upper  
 Inclusion 2--Landform: Channels; position on slope: upper  
 Inclusion 3--Landform: Inset fans

***Major Component Description***

**Izo Series**  
*Elevation:* 4,500 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Very gravelly sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Izo: Burrobrush  
 Inclusion 1: Galleta  
 Inclusion 2: Big sagebrush  
 Inclusion 3: Indian ricegrass

***Ecological Site***

Izo: 029XY041NV  
 Inclusion 1: 029XY041NV  
 Inclusion 2: 029XY009NV  
 Inclusion 3: 029XY012NV

**1830--Downeyville-Rock outcrop complex, 15 to 50 percent slopes*****Composition*****Major Components**

Downeyville very cobbly fine sandy loam, 15 to 50 percent slopes--65 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Lithic Torriorthents extremely gravelly sandy loam, 15 to 50 percent slopes--7 percent  
 Inclusion 2: Typic Torriorthents stony loam, 30 to 75 percent slopes--3 percent  
 Inclusion 3: Lyx extremely gravelly sandy loam, 4 to 15 percent slopes--3 percent  
 Inclusion 4: Stewval very stony loam, 15 to 50 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Downeyville--Landform: Hills  
 Rock outcrop--Landform: Hills  
 Inclusion 1--Landform: Hills; geomorphic position: backslope  
 Inclusion 2--Landform: Hills; geomorphic position: footslope  
 Inclusion 3--Landform: Alluvial fans  
 Inclusion 4--Landform: Hills; geomorphic position: backslope; aspect: north

***Major Component Description*****Downeyville Series**

*Elevation:* 5,700 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Rock outcrop Miscellaneous Area**

*Elevation:* 5,700 to 6,200 feet  
*Surface layer texture:* Unweathered bedrock

***Dominant Present Vegetation***

Downeyville: Galleta  
 Rock outcrop: None  
 Inclusion 1: Shadscale  
 Inclusion 2: Douglas rabbitbrush, shadscale  
 Inclusion 3: Indian ricegrass, Indian ricegrass, galleta, spiny hopsage  
 Inclusion 4: Black sagebrush, bluegrass

**Ecological Site**

Downeyville: 029XY022NV  
 Rock outcrop: None  
 Inclusion 1: 029XY022NV  
 Inclusion 2: 029XY021NV  
 Inclusion 3: 029XY046NV  
 Inclusion 4: 029XY008NV

**1833--Downeyville-Stewval-Blacktop association****Composition****Major Components**

Downeyville very gravelly sandy loam, 15 to 50 percent slopes--40 percent  
 Stewval very gravelly fine sandy loam, 15 to 50 percent slopes--35 percent  
 Blacktop very gravelly sandy loam, 30 to 75 percent slopes--10 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--7 percent  
 Inclusion 2: Stewval very gravelly sandy loam, 4 to 8 percent slopes--6 percent  
 Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly loamy sand, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Hills  
 Downeyville--Landform: Hills  
 Stewval--Landform: Hills; position on slope: upper; aspect: north  
 Blacktop--Landform: Hills  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Hills; geomorphic position: summit  
 Inclusion 3--Landform: Drainageways

**Major Component Description****Downeyville Series**

*Elevation:* 6,000 to 7,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Stewval Series**

*Elevation:* 6,000 to 7,800 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Blacktop Series**

*Elevation:* 6,000 to 7,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

Downeyville: Indian ricegrass, galleta  
 Stewval: Black sagebrush, galleta  
 Blacktop: Shadscale  
 Inclusion 1: None  
 Inclusion 2: Black sagebrush, galleta  
 Inclusion 3: Wyoming big sagebrush

**Ecological Site**

Downeyville: 029XY022NV  
 Stewval: 029XY008NV  
 Blacktop: 029XY033NV  
 Inclusion 1: none  
 Inclusion 2: 029XY008NV  
 Inclusion 3: 029XY049NV

**1834--Downeyville-Blacktop association****Composition****Major Components**

Downeyville very gravelly sandy loam, 8 to 30 percent slopes--70 percent  
 Blacktop very gravelly sandy loam, 30 to 50 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--7 percent  
 Inclusion 2: Stewval very gravelly loam, 4 to 30 percent slopes--6 percent  
 Inclusion 3: Izo very gravelly sand, 2 to 15 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Hills  
 Downeyville--Landform: Hills  
 Blacktop--Landform: Hills; geomorphic position: backslope  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Hills; aspect: north  
 Inclusion 3--Landform: Drainageways

**Major Component Description****Downeyville Series**

*Elevation:* 5,000 to 6,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Blacktop Series**

*Elevation:* 5,000 to 6,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Downeyville: Indian ricegrass, galleta  
 Blacktop: Shadscale  
 Inclusion 1: None  
 Inclusion 2: Black sagebrush, galleta  
 Inclusion 3: Burrobrush

#### ***Ecological Site***

Downeyville: 029XY022NV  
 Blacktop: 029XY033NV  
 Inclusion 1: none  
 Inclusion 2: 029XY008NV  
 Inclusion 3: 029XY041NV

### **1835--Downeyville-Goldyke-Blacktop association**

#### ***Composition***

##### **Major Components**

Downeyville very stony fine sandy loam, 8 to 30 percent slopes--35 percent  
 Goldyke gravelly sandy loam, 4 to 30 percent slopes--30 percent  
 Blacktop very stony fine sandy loam, 30 to 50 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Rock outcrop--5 percent  
 Inclusion 2: Stewval very gravelly sandy loam, 8 to 50 percent slopes--5 percent  
 Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic extremely gravelly loamy sand, 2 to 15 percent slopes--3 percent  
 Inclusion 4: Pintwater very gravelly sandy loam, dry, 8 to 50 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Downeyville--Landform: Hills  
 Goldyke--Landform: Hills; geomorphic position: shoulder

Blacktop--Landform: Hills; geomorphic position: backslope  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Hills; position on slope: upper; aspect: north  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Hills; position on slope: lower

#### ***Major Component Description***

##### **Downeyville Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 45 percent gravel  
*Surface layer texture:* Very stony fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Goldyke Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

##### **Blacktop Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 20 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very stony fine sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Downeyville: Galleta, spiny menodora  
 Goldyke: Bailey greasewood, shadscale, spiny menodora  
 Blacktop: Bailey greasewood, shadscale  
 Inclusion 1: None  
 Inclusion 2: Black sagebrush  
 Inclusion 3: Big sagebrush  
 Inclusion 4: Bailey greasewood, shadscale

#### ***Ecological Site***

Downeyville: 029XY037NV  
 Goldyke: 029XY037NV  
 Blacktop: 029XY033NV  
 Inclusion 1: none  
 Inclusion 2: 029XY008NV  
 Inclusion 3: 029XY009NV  
 Inclusion 4: 029XY022NV

**1840--Veet-Cliffdown association****Composition****Major Components**

Veet very gravelly sandy loam, 2 to 8 percent slopes--  
50 percent

Cliffdown gravelly sandy loam, 2 to 8 percent slopes--  
40 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, sandy-skeletal, mixed,  
mesic very gravelly sandy loam, 2 to 8 percent  
slopes--4 percent

Inclusion 2: Lyx very gravelly sandy loam, 2 to 8  
percent slopes--3 percent

Inclusion 3: Rebel sandy loam, 2 to 8 percent slopes--3  
percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Veet--Landform: Inset fans

Cliffdown--Landform: Inset fans; position on slope:  
lower

Inclusion 1--Landform: Inset fans; position on slope:  
upper

Inclusion 2--Landform: Inset fans; position on slope:  
lower

Inclusion 3--Landform: Inset fans

**Major Component Description****Veet Series**

*Elevation:* 5,500 to 6,500 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 20 percent cobbles; 35  
percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed  
rocks

**Cliffdown Series**

*Elevation:* 6,500 to 7,000 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed  
rocks

**Dominant Present Vegetation**

Veet: Indian ricegrass, Wyoming big sagebrush, galleta,  
spiny hopsage

Cliffdown: Bud sagebrush, winterfat

Inclusion 1: Big sagebrush

Inclusion 2: Douglas rabbitbrush

Inclusion 3: Wyoming big sagebrush

**Ecological Site**

Veet: 029XY049NV

Cliffdown: 029XY042NV

Inclusion 1: 029XY009NV

Inclusion 2: 029XY046NV

Inclusion 3: 028BY045NV

**1845--Veet-Leo-Minnye association****Composition****Major Components**

Veet very gravelly sandy loam, 2 to 8 percent slopes--  
60 percent

Leo very gravelly sandy loam, 2 to 8 percent slopes--  
15 percent

Minnye very gravelly sandy loam, 2 to 8 percent  
slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, sandy-skeletal, mixed,  
mesic very stony sandy loam, 2 to 8 percent slopes--  
6 percent

Inclusion 2: Cliffdown very gravelly sandy loam, 2 to 8  
percent slopes--4 percent

**Map Unit Setting**

*Landscape position:*

Veet--Landform: Inset fans; position on slope: upper

Leo--Landform: Inset fans; position on slope: lower

Minnye--Landform: Fan remnants; position on slope:  
lower

Inclusion 1--Landform: Channels

Inclusion 2--Landform: Inset fans

**Major Component Description****Veet Series**

*Elevation:* 5,000 to 6,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 10 percent cobbles; 35  
percent gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed  
rocks

**Leo Series**

*Elevation:* 5,000 to 6,000 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 5 percent cobbles; 50 percent  
gravel

*Surface layer texture:* Very gravelly sandy loam

*Drainage class:* Excessively drained

*Dominant parent material:* Alluvium derived from mixed  
rocks

**Minnye Series**

*Elevation:* 5,000 to 6,000 feet

*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Veet: Indian ricegrass, Nevada ephedra, Wyoming big sagebrush, galleta, spiny hopsage  
 Leo: Galleta, spiny hopsage  
 Minnye: Galleta, galleta, spiny menodora, spiny menodora  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Bottlebrush squirreltail, bud sagebrush, winterfat

#### ***Ecological Site***

Veet: 029XY049NV  
 Leo: 029XY016NV  
 Minnye: 029XY036NV  
 Inclusion 1: 029XY009NV  
 Inclusion 2: 029XY042NV

### **1851--Garhill-Tognoni association**

#### ***Composition***

**Major Components**  
 Garhill very stony loamy fine sand, 4 to 30 percent slopes--45 percent  
 Tognoni very cobbly fine sandy loam, 8 to 50 percent slopes--40 percent  
**Contrasting Inclusions**  
 Inclusion 1: Rock outcrop--8 percent  
 Inclusion 2: Pintwater very cobbly sandy loam, dry, 8 to 50 percent slopes--5 percent  
 Inclusion 3: Izo very stony loam, 2 to 8 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Garhill--Landform: Hills; geomorphic position: shoulder  
 Tognoni--Landform: Hills; geomorphic position: backslope  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Hills  
 Inclusion 3--Landform: Drainageways

#### ***Major Component Description***

**Garhill Series**  
*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Very stony loamy fine sand  
*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Tognoni Series**

*Elevation:* 5,600 to 6,800 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent cobbles; 20 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Garhill: Galleta  
 Tognoni: Bailey greasewood, galleta, shadscale  
 Inclusion 1: None  
 Inclusion 2: Bailey greasewood, shadscale  
 Inclusion 3: Burrobrush

#### ***Ecological Site***

Garhill: 029XY022NV  
 Tognoni: 029XY022NV  
 Inclusion 1: none  
 Inclusion 2: 029BY022NV  
 Inclusion 3: 029XY041NV

### **1860--Old Camp-Colbar-Rock outcrop association**

#### ***Composition***

**Major Components**  
 Old Camp very gravelly loam, 15 to 50 percent slopes--40 percent  
 Colbar cobbly loam, 15 to 50 percent slopes--30 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent  
**Contrasting Inclusions**  
 Inclusion 1: Jung very gravelly loam, 15 to 50 percent slopes--8 percent  
 Inclusion 2: Stewval very gravelly sandy loam, 8 to 30 percent slopes--5 percent  
 Inclusion 3: Lithic Argixerolls, loamy-skeletal, mixed, mesic very stony loam, 8 to 30 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Old Camp--Landform: Hills; aspect: north  
 Colbar--Landform: Hills; geomorphic position: backslope  
 Rock outcrop--Landform: Hills; position on slope: areas of exposed rock  
 Inclusion 1--Landform: Hills; geomorphic position: footslope  
 Inclusion 2--Landform: Hills; aspect: south  
 Inclusion 3--Landform: Hills; aspect: north

**Major Component Description****Old Camp Series***Elevation:* 6,200 to 6,800 feet*Precipitation:* About 9 inches*Air temperature:* About 47 degrees*Frost-free season:* About 110 days*Surface layer texture:* Very gravelly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Colbar Series***Elevation:* 6,200 to 6,800 feet*Precipitation:* About 9 inches*Air temperature:* About 48 degrees*Frost-free season:* About 100 days*Surface rock fragments:* 25 percent cobbles; 15 percent gravel*Surface layer texture:* Cobbly loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Rock outcrop Miscellaneous Area***Elevation:* 6,200 to 6,800 feet*Surface layer texture:* Unweathered bedrock**Dominant Present Vegetation**

Old Camp: Wyoming big sagebrush, bottlebrush squirreltail

Colbar: Wyoming big sagebrush

Rock outcrop: None

Inclusion 1: Black sagebrush

Inclusion 2: Black sagebrush

Inclusion 3: Wyoming big sagebrush, singleleaf pinyon

**Ecological Site**

Old Camp: 027XY007NV

Colbar: 027XY007NV

Rock outcrop: None

Inclusion 1: 027XY032NV

Inclusion 2: 029XY008NV

Inclusion 3: 027XY081NV

**1891--Blacktop-Downeyville-Rock outcrop association****Composition****Major Components**

Blacktop very gravelly sandy loam, 30 to 75 percent slopes--40 percent

Downeyville very gravelly sandy loam, 15 to 50 percent slopes--35 percent

Rock outcrop unweathered bedrock, 2 to 99 percent slopes--10 percent

**Contrasting Inclusions**

Inclusion 1: Izo very gravelly loamy sand, 4 to 15 percent slopes--5 percent

Inclusion 2: Gabbvally very stony loam, 30 to 50 percent slopes--5 percent

Inclusion 3: Unsel very gravelly loam, moist, 4 to 15 percent slopes--5 percent

**Map Unit Setting***Landscape position:* Hills and intermontane basins

Blacktop--Landform: Hills; geomorphic position: backslope

Downeyville--Landform: Hills; geomorphic position: backslope

Rock outcrop--Landform: Hills; position on slope: areas of exposed rock

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Hills; aspect: north

Inclusion 3--Landform: Fan remnants

**Major Component Description****Blacktop Series***Elevation:* 4,800 to 6,200 feet*Precipitation:* About 6 inches*Air temperature:* About 53 degrees*Frost-free season:* About 140 days*Surface rock fragments:* 10 percent cobbles; 40 percent gravel*Surface layer texture:* Very gravelly sandy loam*Drainage class:* Somewhat excessively drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Downeyville Series***Elevation:* 4,800 to 6,200 feet*Precipitation:* About 6 inches*Air temperature:* About 53 degrees*Frost-free season:* About 120 days*Surface rock fragments:* 10 percent cobbles; 45 percent gravel*Surface layer texture:* Very gravelly sandy loam*Drainage class:* Well drained*Dominant parent material:* Residuum and colluvium derived from volcanic rocks**Rock outcrop Miscellaneous Area***Elevation:* 4,800 to 6,200 feet*Surface layer texture:* Unweathered bedrock**Dominant Present Vegetation**

Blacktop: Bailey greasewood, shadscale

Downeyville: Indian ricegrass, galleta

Rock outcrop: None

Inclusion 1: Burrobrush

Inclusion 2: Wyoming big sagebrush, galleta

Inclusion 3: Bailey greasewood, galleta, shadscale

**Ecological Site**

Blacktop: 029XY033NV

Downeyville: 029XY022NV

Rock outcrop: None

Inclusion 1: 029XY041NV

Inclusion 2: 029XY010NV

Inclusion 3: 029XY087NV

**1900--Playas****Composition****Major Components**

Playas silty clay loam, 0 to 1 percent slopes--100 percent

**Map Unit Setting**

*Landscape position:* Bolsons

Playas--Landform: Playas

**Major Component Description****Playas Miscellaneous Area**

*Elevation:* 4,200 to 4,600 feet

*Surface layer texture:* Silty clay loam

**Dominant Present Vegetation**

Playas: None

**Ecological Site**

Playas: None

**1901--Playas-Slaw association****Composition****Major Components**

Playas silty clay loam, 0 to 1 percent slopes--60 percent

Slaw silt loam, 0 to 2 percent slopes--30 percent

**Contrasting Inclusions**

Inclusion 1: Kawich fine sand, 2 to 15 percent slopes--7 percent

Inclusion 2: Cirac fine sandy loam, dry, 0 to 2 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Bolsons

Playas--Landform: Playas

Slaw--Landform: Alluvial flats

Inclusion 1--Landform: Dunes

Inclusion 2--Landform: Alluvial flats; position on slope: upper

**Major Component Description****Playas Miscellaneous Area**

*Elevation:* 4,200 to 4,600 feet

*Surface layer texture:* Silty clay loam

**Slaw Series**

*Elevation:* 4,200 to 4,600 feet

*Precipitation:* About 5 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Playas: None

Slaw: Black greasewood

Inclusion 1: Indian ricegrass, black greasewood

Inclusion 2: Black greasewood, shadscale

**Ecological Site**

Slaw: 029XY076NV

Playas: None

Inclusion 1: 029XY018NV

Inclusion 2: 029XY024NV

**1902--Slickens****Composition****Major Components**

Slickens silt loam, 0 to 4 percent slopes--100 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Slickens--Landform: Fan remnants

**Major Component Description****Slickens Miscellaneous Area**

*Elevation:* 4,000 to 6,000 feet

*Surface layer texture:* Silt loam

**Dominant Present Vegetation**

Slickens: None

**Ecological Site**

Slickens: None

**1910--Yomba gravelly fine sandy loam, 0 to 2 percent slopes****Composition****Major Components**

Yomba gravelly fine sandy loam, 0 to 2 percent slopes--90 percent

**Contrasting Inclusions**

Inclusion 1: Yomba sandy loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Playas--3 percent

Inclusion 3: Kawich sand, 0 to 2 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Bolsons

Yomba--Landform: Alluvial flats

Inclusion 1--Landform: Alluvial flats; position on slope: upper

Inclusion 2--Landform: Playas

Inclusion 3--Landform: Dunes

**Major Component Description****Yomba Series**

*Elevation:* 4,600 to 5,500 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Yomba: Bud sagebrush, galleta, shadscale  
 Inclusion 1: Bailey greasewood, bud sagebrush, shadscale  
 Inclusion 2: None  
 Inclusion 3: Indian ricegrass

#### ***Ecological Site***

Yomba: 029XY017NV  
 Inclusion 1: 029XY087NV  
 Inclusion 2: none  
 Inclusion 3: 029XY018NV

### **1911--Yomba-Playas association**

#### ***Composition***

##### **Major Components**

Yomba gravelly fine sandy loam, 0 to 2 percent slopes--50 percent  
 Playas silty clay loam, 0 to 1 percent slopes--20 percent  
 Yomba gravelly fine sandy loam, 0 to 2 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Typic Torriorthents, sandy-skeletal, mixed, mesic gravelly fine sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Cirac sandy loam, dry, 0 to 2 percent slopes--5 percent  
 Inclusion 3: Unsel gravelly sandy loam, 2 to 4 percent slopes--3 percent  
 Inclusion 4: Duric Camborthids, coarse-loamy, mixed, mesic fine sandy loam, 0 to 4 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Yomba--Landform: Alluvial flats  
 Playas--Landform: Playas  
 Yomba--Landform: Alluvial flats; position on slope: upper  
 Inclusion 1--Landform: Alluvial flats  
 Inclusion 2--Landform: Alluvial flats; position on slope: upper  
 Inclusion 3--Landform: Fan remnants  
 Inclusion 4--Landform: Alluvial flats; position on slope: lower

#### ***Major Component Description***

##### **Yomba Series**

*Elevation:* 4,600 to 5,500 feet  
*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Playas Miscellaneous Area**

*Elevation:* 4,600 to 5,500 feet  
*Surface layer texture:* Silty clay loam

##### **Yomba Series**

*Elevation:* 4,600 to 5,500 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Yomba: Bud sagebrush, galleta, shadscale  
 Playas: None  
 Yomba: Bailey greasewood, bud sagebrush, shadscale  
 Inclusion 1: Bailey greasewood, galleta, shadscale  
 Inclusion 2: Black greasewood, shadscale  
 Inclusion 3: Bud sagebrush, galleta, shadscale  
 Inclusion 4: Shadscale

#### ***Ecological Site***

Yomba: 029XY017NV  
 Yomba: 029XY087NV  
 Playas: None  
 Inclusion 1: 029XY087NV  
 Inclusion 2: 029XY024NV  
 Inclusion 3: 029XY017NV  
 Inclusion 4: 029XY059NV

### **1930--Stonell-Wardenot-Izo association**

#### ***Composition***

##### **Major Components**

Stonell gravelly sandy loam, 2 to 8 percent slopes--35 percent  
 Wardenot very gravelly sandy loam, 2 to 8 percent slopes--30 percent  
 Izo very gravelly sand, 0 to 4 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Duric Haplargids, fine-loamy, mixed, mesic gravelly sandy loam, 2 to 4 percent slopes--10 percent  
 Inclusion 2: Typic Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--5 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Stonell--Landform: Fan remnants  
 Wardenot--Landform: Inset fans  
 Izo--Landform: Drainageways  
 Inclusion 1--Landform: Fan remnants; position on slope: upper  
 Inclusion 2--Landform: Inset fans; position on slope: lower

**Major Component Description****Stonell Series**

*Elevation:* 5,300 to 5,800 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 5 percent cobbles; 25 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Wardenot Series**

*Elevation:* 5,300 to 5,800 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 55 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Izo Series**

*Elevation:* 5,300 to 5,800 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Very gravelly sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Stonell: Bailey greasewood, bud sagebrush, galleta, shadscale  
 Wardenot: Bailey greasewood, bud sagebrush, shadscale  
 Izo: Burrobrush  
 Inclusion 1: Bailey greasewood, bud sagebrush, galleta, shadscale  
 Inclusion 2: Bailey greasewood, bud sagebrush, galleta, shadscale

**Ecological Site**

Stonell: 029XY087NV  
 Wardenot: 029XY087NV  
 Izo: 029XY041NV

Inclusion 1: 029XY017NV  
 Inclusion 2: 029XY017NV

**1950--Pintwater-Izo association****Composition****Major Components**

Pintwater very gravelly fine sandy loam, 2 to 15 percent slopes--60 percent  
 Izo stony loamy coarse sand, 0 to 8 percent slopes--30 percent

**Contrasting Inclusions**

Inclusion 1: Stewval cobbly sandy loam, 4 to 30 percent slopes--7 percent  
 Inclusion 2: Rock outcrop--3 percent

**Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Pintwater--Landform: Pediments  
 Izo--Landform: Drainageways  
 Inclusion 1--Landform: Hills; position on slope: upper; aspect: north  
 Inclusion 2--Landform: Ridges

**Major Component Description****Pintwater Series**

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Izo Series**

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 5 percent cobbles; 10 percent gravel  
*Surface layer texture:* Stony loamy coarse sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Pintwater: Bailey greasewood, galleta, shadscale  
 Izo: Burrobrush  
 Inclusion 1: Black sagebrush, galleta  
 Inclusion 2: None

**Ecological Site**

Pintwater: 029XY022NV  
 Izo: 029XY041NV  
 Inclusion 1: 029XY008NV  
 Inclusion 2: none

## 1951--Pintwater-Rock outcrop complex, 15 to 50 percent slopes

### *Composition*

#### **Major Components**

Pintwater very cobbly fine sandy loam, 15 to 50 percent slopes--75 percent  
 Rock outcrop unweathered bedrock, 2 to 99 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Univega gravelly loamy sand, 4 to 15 percent slopes--3 percent  
 Inclusion 2: Stumble loamy sand, 2 to 15 percent slopes--2 percent

### *Map Unit Setting*

*Landscape position:* Hills and intermontane basins  
 Pintwater--Landform: Hills  
 Rock outcrop--Landform: Hills; position on slope: areas of exposed rock  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Sand sheets

### *Major Component Description*

#### **Pintwater Series**

*Elevation:* 5,000 to 6,500 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent cobbles; 30 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,000 to 6,500 feet  
*Surface layer texture:* Unweathered bedrock

### *Dominant Present Vegetation*

Pintwater: Bailey greasewood, bud sagebrush, shadscale  
 Rock outcrop: None  
 Inclusion 1: Fourwing saltbush, galleta  
 Inclusion 2: Indian ricegrass

### *Ecological Site*

Pintwater: 029XY022NV  
 Rock outcrop: None  
 Inclusion 1: 029XY046NV  
 Inclusion 2: 029XY012NV

## 1953--Pintwater-Terlco association

### *Composition*

#### **Major Components**

Pintwater gravelly fine sandy loam, 8 to 30 percent slopes--50 percent

Terlco very gravelly sandy loam, 2 to 8 percent slopes--35 percent

#### **Contrasting Inclusions**

Inclusion 1: Downeyville very gravelly sandy loam, moist, 15 to 50 percent slopes--7 percent  
 Inclusion 2: Rock outcrop--4 percent  
 Inclusion 3: Stewval very cobbly sandy loam, 15 to 50 percent slopes--3 percent  
 Inclusion 4: Izo very gravelly sand, 2 to 8 percent slopes--1 percent

### *Map Unit Setting*

*Landscape position:* Hills and intermontane basins  
 Pintwater--Landform: Hills; geomorphic position: backslope  
 Terlco--Landform: Fan remnants  
 Inclusion 1--Landform: Hills; geomorphic position: footslope  
 Inclusion 2--Landform: Ridges  
 Inclusion 3--Landform: Hills; aspect: north  
 Inclusion 4--Landform: Drainageways

### *Major Component Description*

#### **Pintwater Series**

*Elevation:* 5,000 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 25 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Terlco Series**

*Elevation:* 5,000 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 10 percent cobbles; 45 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

### *Dominant Present Vegetation*

Pintwater: Bailey greasewood, galleta, shadscale, spiny menodora  
 Terlco: Bailey greasewood, galleta, shadscale, spiny menodora  
 Inclusion 1: Bailey greasewood, shadscale, spiny menodora  
 Inclusion 2: None  
 Inclusion 3: Black sagebrush, galleta  
 Inclusion 4: Burrobrush

### *Ecological Site*

Pintwater: 029XY037NV  
 Terlco: 029XY036NV

Inclusion 1: 029XY037NV  
 Inclusion 2: none  
 Inclusion 3: 029XY008NV  
 Inclusion 4: 029XY041NV

**1954--Pintwater-Wardenot-Unsel association**

***Composition***

**Major Components**

Pintwater very cobbly fine sandy loam, 8 to 30 percent slopes--35 percent  
 Wardenot very gravelly loamy sand, 4 to 8 percent slopes--30 percent  
 Unsel gravelly loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--5 percent  
 Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Terlco very gravelly fine sandy loam, 2 to 8 percent slopes--5 percent

***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Pintwater--Landform: Hills  
 Wardenot--Landform: Inset fans  
 Unsel--Landform: Fan remnants  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Drainageways  
 Inclusion 3--Landform: Fan remnants; position on slope: lower

***Major Component Description***

**Pintwater Series**

*Elevation:* 5,200 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent cobbles; 30 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Wardenot Series**

*Elevation:* 5,200 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 55 percent gravel  
*Surface layer texture:* Very gravelly loamy sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Unsel Series**

*Elevation:* 5,200 to 6,200 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent gravel  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Pintwater: Bailey greasewood, galleta, spiny menodora  
 Wardenot: Bailey greasewood, shadscale, spiny menodora  
 Unsel: Bailey greasewood, galleta, shadscale  
 Inclusion 1: None  
 Inclusion 2: Burrobrush  
 Inclusion 3: Bailey greasewood, galleta, shadscale, spiny menodora

***Ecological Site***

Pintwater: 029XY037NV  
 Wardenot: 029XY036NV  
 Unsel: 029XY087NV  
 Inclusion 1: none  
 Inclusion 2: 029XY041NV  
 Inclusion 3: 029XY036NV

**1955--Pintwater-Stumble-Downeyville association**

***Composition***

**Major Components**

Pintwater very cobbly fine sandy loam, 4 to 50 percent slopes--35 percent  
 Stumble loamy sand, 2 to 15 percent slopes--30 percent  
 Downeyville loamy sand, 8 to 15 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Typic Torriorthents, sandy-skeletal, mixed, mesic cobbly loamy sand, 2 to 30 percent slopes--8 percent  
 Inclusion 2: Stewval cobbly fine sandy loam, 4 to 30 percent slopes--4 percent  
 Inclusion 3: Rock outcrop--3 percent

***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Pintwater--Landform: Pediments  
 Stumble--Landform: Sand sheets  
 Downeyville--Landform: Hills; geomorphic position: shoulder  
 Inclusion 1--Landform: Hills  
 Inclusion 2--Landform: Hills  
 Inclusion 3--Landform: Ridges

***Major Component Description***

**Pintwater Series**

*Elevation:* 5,000 to 5,600 feet  
*Precipitation:* About 5 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days

*Surface rock fragments:* 30 percent cobbles; 30 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Stumble Series**

*Elevation:* 5,000 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Eolian sand and mixed alluvium

#### **Downeyville Series**

*Elevation:* 5,000 to 5,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface layer texture:* Loamy sand  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Pintwater: Bailey greasewood, galleta, shadscale  
 Stumble: Indian ricegrass, Nevada ephedra, fourwing saltbush, horsebrush  
 Downeyville: Indian ricegrass, fourwing saltbush  
 Inclusion 1: Indian ricegrass, fourwing saltbush, galleta  
 Inclusion 2: Black sagebrush  
 Inclusion 3: None

#### ***Ecological Site***

Pintwater: 029XY022NV  
 Stumble: 029XY012NV  
 Downeyville: 029XY012NV  
 Inclusion 1: 029XY046NV  
 Inclusion 2: 029XY008NV  
 Inclusion 3: none

### **1970--Linoyer-Rebel association**

#### ***Composition***

#### **Major Components**

Linoyer very fine sandy loam, 0 to 4 percent slopes--50 percent  
 Rebel sandy loam, 0 to 4 percent slopes--45 percent

#### **Contrasting Inclusions**

Inclusion 1: Mosida loam, 0 to 4 percent slopes--3 percent  
 Inclusion 2: Alley gravelly sandy loam, 2 to 4 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Linoyer--Landform: Fan skirts

Rebel--Landform: Inset fans; position on slope: lower  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Fan remnants

#### ***Major Component Description***

#### **Linoyer Series**

*Elevation:* 5,000 to 7,000 feet  
*Precipitation:* About 8 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Rebel Series**

*Elevation:* 5,000 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Linoyer: Indian ricegrass, winterfat, winterfat  
 Rebel: Wyoming big sagebrush, basin wildrye, winterfat  
 Inclusion 1: Basin big sagebrush, basin wildrye  
 Inclusion 2: Wyoming big sagebrush, bottlebrush squirreltail

#### ***Ecological Site***

Linoyer: 028BY013NV  
 Rebel: 028BY045NV  
 Inclusion 1: 028BY003NV  
 Inclusion 2: 028BY010NV

### **1990--Tognoni-Blacktop association**

#### ***Composition***

#### **Major Components**

Tognoni extremely cobbly fine sandy loam, 15 to 50 percent slopes--45 percent  
 Tognoni very cobbly fine sandy loam, 2 to 15 percent slopes--20 percent  
 Blacktop very stony fine sandy loam, 30 to 75 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Lithic Haplargids, loamy-skeletal, mixed, mesic very gravelly sandy loam, 0 to 4 percent slopes--9 percent  
 Inclusion 2: Rock outcrop--3 percent  
 Inclusion 3: Izo very gravelly sand, 2 to 8 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Plateaus  
 Tognoni--Landform: Plateaus

Tognoni--Landform: Plateaus; geomorphic position: summit

Blacktop--Landform: Hills; geomorphic position: backslope

Inclusion 1--Landform: Hills; geomorphic position: summit; position on slope: upper

Inclusion 2--Landform: Ridges

Inclusion 3--Landform: Drainageways

### ***Major Component Description***

#### **Tognoni Series**

*Elevation:* 5,500 to 6,300 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 40 percent cobbles; 30 percent gravel

*Surface layer texture:* Extremely cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Tognoni Series**

*Elevation:* 5,500 to 6,300 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 20 percent cobbles; 20 percent gravel

*Surface layer texture:* Very cobbly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Blacktop Series**

*Elevation:* 5,500 to 6,300 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 140 days

*Surface rock fragments:* 10 percent cobbles; 40 percent gravel

*Surface layer texture:* Very stony fine sandy loam

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

### ***Dominant Present Vegetation***

Tognoni: Bud sagebrush, galleta, shadscale

Tognoni: Indian ricegrass, galleta, shadscale

Blacktop: Shadscale

Inclusion 1: Bud sagebrush, galleta, shadscale

Inclusion 2: None

Inclusion 3: Burrobrush

### ***Ecological Site***

Tognoni: 029XY022NV

Tognoni: 029XY022NV

Blacktop: 029XY033NV

Inclusion 1: 029XY017NV

Inclusion 2: none

Inclusion 3: 029XY041NV

## **2040--Silverbow-Rock outcrop complex, 8 to 30 percent slopes**

### ***Composition***

#### **Major Components**

Silverbow very stony fine sandy loam, 8 to 30 percent slopes--60 percent

Rock outcrop unweathered bedrock, 4 to 75 percent slopes--25 percent

#### **Contrasting Inclusions**

Inclusion 1: Izo very stony loamy sand, 2 to 8 percent slopes--5 percent

Inclusion 2: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic extremely stony sandy loam, 2 to 30 percent slopes--5 percent

Inclusion 3: Blacktop very cobbly sandy loam, 8 to 50 percent slopes--5 percent

### ***Map Unit Setting***

*Landscape position:* Hills

Silverbow--Landform: Hills

Rock outcrop--Landform: Hills; position on slope: areas of exposed rock

Inclusion 1--Landform: Drainageways

Inclusion 2--Landform: Hills

Inclusion 3--Landform: Hills

### ***Major Component Description***

#### **Silverbow Series**

*Elevation:* 5,200 to 6,000 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent stones and boulders; 30 percent cobbles; 20 percent gravel

*Surface layer texture:* Very stony fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Colluvium derived from volcanic rocks

#### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,200 to 6,000 feet

*Surface layer texture:* Unweathered bedrock

### ***Dominant Present Vegetation***

Silverbow: Bailey greasewood, shadscale, spiny menodora

Rock outcrop: None

Inclusion 1: Burrobrush

Inclusion 2: Big sagebrush

Inclusion 3: Shadscale

### ***Ecological Site***

Silverbow: 029XY036NV

Rock outcrop: None

Inclusion 1: 029XY041NV

Inclusion 2: 029XY009NV

Inclusion 3: 029XY033NV

**2080--Maggie-Pintwater-Izo association****Composition****Major Components**

Maggie very gravelly loam, 2 to 8 percent slopes--50 percent  
 Pintwater very cobbly fine sandy loam, 15 to 50 percent slopes--30 percent  
 Izo stony loamy coarse sand, 0 to 8 percent slopes--10 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--6 percent  
 Inclusion 2: Duric Haplargids, fine-loamy, mixed, mesic very gravelly sandy loam, 2 to 15 percent slopes--2 percent  
 Inclusion 3: Leo stony loamy sand, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Maggie--Landform: Hills  
 Pintwater--Landform: Hills  
 Izo--Landform: Drainageways  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Fan remnants  
 Inclusion 3--Landform: Drainageways

**Major Component Description****Maggie Series**

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Pintwater Series**

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent cobbles; 30 percent gravel  
*Surface layer texture:* Very cobbly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Izo Series**

*Elevation:* 5,500 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 2 percent stones and boulders; 5 percent cobbles; 10 percent gravel  
*Surface layer texture:* Stony loamy coarse sand  
*Drainage class:* Excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Maggie: Bailey greasewood, galleta, spiny menodora  
 Pintwater: Bailey greasewood, galleta, spiny menodora  
 Izo: Burrobrush  
 Inclusion 1: None  
 Inclusion 2: Spiny menodora  
 Inclusion 3: Spiny hopsage

**Ecological Site**

Maggie: 029XY037NV  
 Pintwater: 029XY037NV  
 Izo: 029XY041NV  
 Inclusion 1: none  
 Inclusion 2: 029XY036NV  
 Inclusion 3: 029XY016NV

**2081--Maggie-Stewval-Pintwater association****Composition****Major Components**

Maggie very gravelly loam, 8 to 30 percent slopes--35 percent  
 Stewval very gravelly fine sandy loam, 8 to 50 percent slopes--30 percent  
 Pintwater very gravelly fine sandy loam, 15 to 50 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Rock outcrop--6 percent  
 Inclusion 2: Tognoni very cobbly sandy loam, 8 to 15 percent slopes--4 percent  
 Inclusion 3: Xeric Torriorthents, sandy-skeletal, mixed, mesic very cobbly sandy loam, 2 to 8 percent slopes--3 percent  
 Inclusion 4: Unsel very gravelly fine sandy loam, moist, 2 to 15 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Hills and intermontane basins  
 Maggie--Landform: Hills  
 Stewval--Landform: Hills; geomorphic position: backslope; aspect: north  
 Pintwater--Landform: Hills; geomorphic position: backslope  
 Inclusion 1--Landform: Ridges  
 Inclusion 2--Landform: Hills; geomorphic position: summit  
 Inclusion 3--Landform: Drainageways  
 Inclusion 4--Landform: Fan remnants

**Major Component Description****Maggie Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel

*Surface layer texture:* Very gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Stewval Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 51 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 55 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### **Pintwater Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

#### ***Dominant Present Vegetation***

Maggie: Bailey greasewood, galleta, spiny menodora  
 Stewval: Black sagebrush, galleta  
 Pintwater: Bailey greasewood, galleta, spiny menodora  
 Inclusion 1: None  
 Inclusion 2: Bailey greasewood, shadscale  
 Inclusion 3: Big sagebrush  
 Inclusion 4: Bailey greasewood, galleta

#### ***Ecological Site***

Maggie: 029XY037NV  
 Stewval: 029XY008NV  
 Pintwater: 029XY037NV  
 Inclusion 1: none  
 Inclusion 2: 029XY022NV  
 Inclusion 3: 029XY009NV  
 Inclusion 4: 029XY087NV

### **2100--Blappert-Rock outcrop association**

#### ***Composition***

**Major Components**  
 Blappert very gravelly sandy loam, 15 to 50 percent slopes--75 percent  
 Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent  
**Contrasting Inclusions**  
 Inclusion 1: Armoine very gravelly sandy loam, 15 to 50 percent slopes--8 percent  
 Inclusion 2: Izo very cobbly loam, 2 to 8 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Hills  
 Blappert--Landform: Mountains; geomorphic position: backslope  
 Rock outcrop--Landform: Hills; position on slope: areas of exposed rock  
 Inclusion 1--Landform: Hills; position on slope: upper; aspect: north  
 Inclusion 2--Landform: Drainageways

#### ***Major Component Description***

##### **Blappert Series**

*Elevation:* 5,600 to 6,400 feet  
*Precipitation:* About 7 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from granitic rocks

##### **Rock outcrop Miscellaneous Area**

*Elevation:* 5,600 to 6,400 feet  
*Surface layer texture:* Unweathered bedrock

#### ***Dominant Present Vegetation***

Blappert: Bailey greasewood, galleta, shadscale  
 Rock outcrop: None  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Indian ricegrass, burrobrush

#### ***Ecological Site***

Blappert: 029XY022NV  
 Rock outcrop: None  
 Inclusion 1: 029XY014NV  
 Inclusion 2: 029XY041NV

### **2110--Luning-Hawsley-Bluewing association**

#### ***Composition***

##### **Major Components**

Luning loamy sand, 2 to 8 percent slopes--45 percent  
 Hawsley loamy sand, 2 to 4 percent slopes--30 percent  
 Bluewing very gravelly loamy sand, 2 to 4 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Typic Torripsamments, mixed, mesic fine sand, 4 to 15 percent slopes--5 percent  
 Inclusion 2: Typic Torriorthents, sandy-skeletal, mixed, mesic gravelly loamy sand, 2 to 4 percent slopes--5 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Luning--Landform: Fan remnants  
 Hawsley--Landform: Sand sheets  
 Bluewing--Landform: Drainageways  
 Inclusion 1--Landform: Dunes

Inclusion 2--Landform: Fan remnants

### **Major Component Description**

#### **Luning Series**

*Elevation:* 4,100 to 5,400 feet

*Precipitation:* About 4 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Hawsley Series**

*Elevation:* 4,100 to 5,400 feet

*Precipitation:* About 6 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Eolian sand and mixed alluvium

#### **Bluewing Series**

*Elevation:* 4,100 to 5,400 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 45 percent gravel

*Surface layer texture:* Very gravelly loamy sand

*Drainage class:* Excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

### **Dominant Present Vegetation**

Luning: Bailey greasewood, Cooper wolfberry, Indian ricegrass

Hawsley: Bailey greasewood, Indian ricegrass, littleleaf horsebrush

Bluewing: Bailey greasewood, burrobrush

Inclusion 1: Indian ricegrass, fourwing saltbush

Inclusion 2: Bailey greasewood, Indian ricegrass

### **Ecological Site**

Luning: 027XY060NV

Hawsley: 027XY009NV

Bluewing: 027XY022NV

Inclusion 1: 027XY016NV

Inclusion 2: 029XY087NV

## **2111--Luning-Izo association**

### **Composition**

#### **Major Components**

Luning loamy sand, 2 to 8 percent slopes--75 percent

Izo very gravelly sand, 2 to 8 percent slopes--15 percent

### **Contrasting Inclusions**

Inclusion 1: Stumble loamy sand, 2 to 4 percent slopes--7 percent

Inclusion 2: Gynelle gravelly loamy sand, dry, 2 to 8 percent slopes--3 percent

### **Map Unit Setting**

*Landscape position:* Fan piedmonts

Luning--Landform: Inset fans

Izo--Landform: Drainageways

Inclusion 1--Landform: Sand sheets

Inclusion 2--Landform: Inset fans; position on slope: lower

### **Major Component Description**

#### **Luning Series**

*Elevation:* 4,600 to 5,300 feet

*Precipitation:* About 4 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Izo Series**

*Elevation:* 4,600 to 5,300 feet

*Precipitation:* About 6 inches

*Air temperature:* About 54 degrees

*Frost-free season:* About 140 days

*Surface rock fragments:* 50 percent gravel

*Surface layer texture:* Very gravelly sand

*Drainage class:* Excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

### **Dominant Present Vegetation**

Luning: Indian ricegrass

Izo: Burrobrush, shadscale

Inclusion 1: Indian ricegrass, fourwing saltbush

Inclusion 2: Indian ricegrass

### **Ecological Site**

Luning: 027XY060NV

Izo: 029XY041NV

Inclusion 1: 029XY012NV

Inclusion 2: 027XY043NV

## **2120--Tert-Whilphang-Geer association**

### **Composition**

#### **Major Components**

Tert loam, 8 to 30 percent slopes--45 percent

Whilphang sandy loam, 4 to 15 percent slopes--25 percent

Geer fine sandy loam, 2 to 4 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Roic gravelly sandy loam, dry, 4 to 30 percent slopes--8 percent

Inclusion 2: Izo very gravelly loamy sand, dry, 2 to 8 percent slopes--4 percent  
 Inclusion 3: Isolde fine sand, moist, 2 to 8 percent slopes--3 percent

### **Map Unit Setting**

#### *Landscape position:*

Tert--Landform: Pediments; geomorphic position: backslope

Whilphang--Landform: Pediments

Geer--Landform: Inset fans

Inclusion 1--Landform: Pediments; position on slope: lower

Inclusion 2--Landform: Channels

Inclusion 3--Landform: Dunes

### **Major Component Description**

#### **Tert Series**

*Elevation:* 5,800 to 6,600 feet

*Precipitation:* About 10 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from lacustrine sediments

#### **Whilphang Series**

*Elevation:* 5,800 to 6,600 feet

*Precipitation:* About 9 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 20 percent gravel

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from lacustrine sediments

#### **Geer Series**

*Elevation:* 5,800 to 6,400 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface layer texture:* Fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### **Dominant Present Vegetation**

Tert: Stansbury cliffrose, Utah juniper, black sagebrush

Whilphang: Nevada ephedra, black sagebrush, galleta

Geer: Indian ricegrass, bud sagebrush, winterfat

Inclusion 1: Bailey greasewood, shadscale

Inclusion 2: Burrobrush

Inclusion 3: Indian ricegrass, hairy horsebrush

### **Ecological Site**

Tert: 029XY081NV

Whilphang: 029XY008NV

Geer: 029XY042NV

Inclusion 1: 029XY033NV

Inclusion 2: 029XY041NV

Inclusion 3: 027XY023NV

### **2121--Tert-Roic association**

### **Composition**

#### **Major Components**

Tert loam, 8 to 30 percent slopes--55 percent

Roic gravelly sandy loam, 4 to 15 percent slopes--30 percent

#### **Contrasting Inclusions**

Inclusion 1: Whilphang gravelly sandy loam, 4 to 15 percent slopes--8 percent

Inclusion 2: Geer fine sandy loam, 2 to 4 percent slopes--4 percent

Inclusion 3: Isolde fine sand, moist, 8 to 30 percent slopes--3 percent

### **Map Unit Setting**

#### *Landscape position:*

Tert--Landform: Pediments

Roic--Landform: Pediments; position on slope: lower

Inclusion 1--Landform: Pediments; position on slope: upper

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Dunes

### **Major Component Description**

#### **Tert Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 10 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from lacustrine sediments

#### **Roic Series**

*Elevation:* 5,300 to 5,700 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 25 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum derived from lacustrine sediments

### **Dominant Present Vegetation**

Tert: Stansbury cliffrose, Utah juniper, black sagebrush

Roic: Bailey greasewood, Indian ricegrass, galleta, shadscale

Inclusion 1: Black sagebrush

Inclusion 2: Indian ricegrass, bud sagebrush, winterfat

Inclusion 3: Indian ricegrass, hairy horsebrush

### **Ecological Site**

Tert: 029XY081NV

Roic: 029XY022NV

Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY042NV  
 Inclusion 3: 027XY023NV

## 2130--Roic-Koyen association

### *Composition*

#### **Major Components**

Roic gravelly sandy loam, 4 to 15 percent slopes--70 percent

Koyen gravelly sandy loam, 2 to 8 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Tert loam, 15 to 50 percent slopes--6 percent

Inclusion 2: Unsel gravelly sandy loam, moist, 2 to 8 percent slopes--6 percent

Inclusion 3: Stumble very gravelly loamy sand, 2 to 8 percent slopes--3 percent

### *Map Unit Setting*

*Landscape position:* Fan piedmonts

Roic--Landform: Pediments

Koyen--Landform: Inset fans

Inclusion 1--Landform: Pediments

Inclusion 2--Landform: Fan remnants

Inclusion 3--Landform: Inset fans; position on slope: upper

### *Major Component Description*

#### **Roic Series**

*Elevation:* 5,200 to 5,700 feet

*Precipitation:* About 5 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 45 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Koyen Series**

*Elevation:* 5,200 to 5,700 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 20 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### *Dominant Present Vegetation*

Roic: Bailey greasewood, galleta, shadscale

Koyen: Fourwing saltbush, galleta

Inclusion 1: Nevada ephedra, Stansbury cliffrose, Utah juniper, black sagebrush

Inclusion 2: Bailey greasewood, galleta, shadscale

Inclusion 3: Indian ricegrass

### *Ecological Site*

Roic: 029XY022NV

Koyen: 029XY046NV

Inclusion 1: 029XY081NV

Inclusion 2: 029XY087NV

Inclusion 3: 029XY012NV

## 2131--Roic-Vindicator-Rock outcrop association

### *Composition*

#### **Major Components**

Roic very gravelly fine sandy loam, 8 to 30 percent slopes--45 percent

Vindicator gravelly sandy loam, 8 to 30 percent slopes--25 percent

Rock outcrop unweathered bedrock, 15 to 99 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Unsel gravelly fine sandy loam, 2 to 8 percent slopes--8 percent

Inclusion 2: Downeyville very stony fine sandy loam, 30 to 50 percent slopes--5 percent

Inclusion 3: Badland--2 percent

### *Map Unit Setting*

*Landscape position:* Hills and intermontane basins

Roic--Landform: Hills

Vindicator--Landform: Hills

Rock outcrop--Landform: Hills; position on slope: areas of exposed rock

Inclusion 1--Landform: Fan remnants

Inclusion 2--Landform: Hills

Inclusion 3--Landform: Hills

### *Major Component Description*

#### **Roic Series**

*Elevation:* 5,000 to 6,000 feet

*Precipitation:* About 4 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 45 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from sedimentary rocks

#### **Vindicator Series**

*Elevation:* 5,000 to 6,000 feet

*Precipitation:* About 7 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 5 percent cobbles; 30 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Rock outcrop Miscellaneous Area**

*Elevation:* 5,000 to 6,000 feet  
*Surface layer texture:* Unweathered bedrock

***Dominant Present Vegetation***

Roic: Bailey greasewood, shadscale  
 Vindicator: Indian ricegrass, shadscale  
 Rock outcrop: None  
 Inclusion 1: Bud sagebrush, galleta, shadscale  
 Inclusion 2: Bailey greasewood, galleta, shadscale  
 Inclusion 3: None

***Ecological Site***

Roic: 029XY033NV  
 Vindicator: 029XY021NV  
 Rock outcrop: None  
 Inclusion 1: 029XY017NV  
 Inclusion 2: 029XY022NV  
 Inclusion 3: none

**2140--Advokay-Blacktop-Itme association**

***Composition***

**Major Components**  
 Advokay gravelly coarse sandy loam, 2 to 8 percent slopes--35 percent  
 Blacktop very gravelly fine sandy loam, 8 to 30 percent slopes--30 percent  
 Itme gravelly loamy sand, 2 to 8 percent slopes--20 percent  
**Contrasting Inclusions**  
 Inclusion 1: Unsel gravelly fine sandy loam, 2 to 8 percent slopes--9 percent  
 Inclusion 2: Stewval very gravelly fine sandy loam, 8 to 15 percent slopes--3 percent  
 Inclusion 3: Rock outcrop--3 percent

***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Advokay--Landform: Hills  
 Blacktop--Landform: Hills  
 Itme--Landform: Inset fans  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Hills; aspect: north  
 Inclusion 3--Landform: Ridges

***Major Component Description***

**Advokay Series**

*Elevation:* 5,400 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Gravelly coarse sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Blacktop Series**

*Elevation:* 5,400 to 6,000 feet

*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Itme Series**

*Elevation:* 5,400 to 6,000 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 54 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Gravelly loamy sand  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Advokay: Indian ricegrass, shadscale  
 Blacktop: Shadscale  
 Itme: Indian ricegrass, shadscale  
 Inclusion 1: Bud sagebrush, galleta, shadscale  
 Inclusion 2: Black sagebrush  
 Inclusion 3: None

***Ecological Site***

Advokay: 029XY017NV  
 Blacktop: 029XY033NV  
 Itme: 029XY017NV  
 Inclusion 1: 029XY017NV  
 Inclusion 2: 029XY008NV  
 Inclusion 3: none

**2141--Advokay-Blacktop association**

***Composition***

**Major Components**  
 Advokay gravelly coarse sandy loam, 4 to 15 percent slopes--65 percent  
 Blacktop very gravelly fine sandy loam, 8 to 30 percent slopes--20 percent  
**Contrasting Inclusions**  
 Inclusion 1: Izo very gravelly loamy sand, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Unsel very gravelly sandy loam, moist, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Stumble loamy sand, 2 to 8 percent slopes--4 percent

***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Advokay--Landform: Hills  
 Blacktop--Landform: Hills  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Fan remnants  
 Inclusion 3--Landform: Sand sheets

**Major Component Description****Advokay Series**

*Elevation:* 5,000 to 5,700 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 50 percent gravel  
*Surface layer texture:* Gravelly coarse sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Blacktop Series**

*Elevation:* 5,000 to 5,700 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 140 days  
*Surface rock fragments:* 10 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Residuum and colluvium derived from volcanic rocks

**Dominant Present Vegetation**

Advokay: Indian ricegrass, bud sagebrush, shadscale  
 Blacktop: Bailey greasewood, bud sagebrush, shadscale  
 Inclusion 1: Burrobrush  
 Inclusion 2: Bailey greasewood, bud sagebrush, shadscale  
 Inclusion 3: Indian ricegrass, littleleaf horsebrush

**Ecological Site**

Advokay: 029XY017NV  
 Blacktop: 029XY033NV  
 Inclusion 1: 029XY041NV  
 Inclusion 2: 029XY087NV  
 Inclusion 3: 029XY012NV

**2150--Gynelle very gravelly loamy sand, 0 to 4 percent slopes****Composition****Major Components**

Gynelle very gravelly loamy sand, 0 to 4 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Typic Haplargids, sandy-skeletal, mixed, mesic very cobbly fine sandy loam, 0 to 4 percent slopes--7 percent  
 Inclusion 2: Aeric Halaquepts, coarse-loamy, mixed (calcareous), mesic loamy sand, 0 to 4 percent slopes--4 percent  
 Inclusion 3: Isolde fine sand, 4 to 15 percent slopes--4 percent

**Map Unit Setting**

*Landscape position:* Bolsons  
 Gynelle--Landform: Fan skirts

Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Lake plains  
 Inclusion 3--Landform: Dunes

**Major Component Description****Gynelle Series**

*Elevation:* 4,100 to 4,700 feet  
*Precipitation:* About 4 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 60 percent gravel  
*Surface layer texture:* Very gravelly loamy sand  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Gynelle: Cooper wolfberry, black greasewood, shadscale  
 Inclusion 1: Cooper wolfberry, black greasewood, shadscale  
 Inclusion 2: Black greasewood, seepweed  
 Inclusion 3: Indian ricegrass

**Ecological Site**

Gynelle: 027XY036NV  
 Inclusion 1: 027XY036NV  
 Inclusion 2: 027XY025NV  
 Inclusion 3: 027XY016NV

**2170--Lathrop-Leo association****Composition****Major Components**

Lathrop very stony fine sandy loam, 4 to 15 percent slopes--50 percent  
 Leo very gravelly sandy loam, 4 to 15 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Typic Haplargids, loamy-skeletal, mixed, mesic, shallow gravelly sandy loam, 4 to 15 percent slopes--8 percent  
 Inclusion 2: Izo very gravelly sand, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Rock outcrop--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Lathrop--Landform: Fan remnants  
 Leo--Landform: Inset fans  
 Inclusion 1--Landform: Pediments  
 Inclusion 2--Landform: Channels  
 Inclusion 3--Landform: Ridges

**Major Component Description****Lathrop Series**

*Elevation:* 5,800 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 52 degrees

*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 30 percent gravel  
*Surface layer texture:* Very stony fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Leo Series**

*Elevation:* 5,800 to 6,200 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 53 degrees  
*Frost-free season:* About 130 days  
*Surface rock fragments:* 5 percent cobbles; 50 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Lathrop: Indian ricegrass, galleta, shadscale, spiny menodora  
 Leo: Indian ricegrass, galleta, shadscale  
 Inclusion 1: Bailey greasewood, shadscale  
 Inclusion 2: Burrobrush  
 Inclusion 3: None

***Ecological Site***

Lathrop: 029XY036NV  
 Leo: 029XY046NV  
 Inclusion 1: 029XY017NV  
 Inclusion 2: 029XY041NV  
 Inclusion 3: none

**2180--Armoine-Beelem association**

***Composition***

**Major Components**  
 Armoine very gravelly sandy loam, 4 to 30 percent slopes--50 percent  
 Beelem gravelly sandy loam, 15 to 30 percent slopes--35 percent  
**Contrasting Inclusions**  
 Inclusion 1: Veet very gravelly sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 2: Chill very gravelly sandy loam, 4 to 30 percent slopes--5 percent  
 Inclusion 3: Rock outcrop--3 percent  
 Inclusion 4: Xeric Torriorthents very gravelly sandy loam, 2 to 8 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Hills and intermontane basins  
 Armoine--Landform: Hills  
 Beelem--Landform: Hills  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Pediments  
 Inclusion 3--Landform: Ridges  
 Inclusion 4--Landform: Drainageways

***Major Component Description***

**Armoine Series**

*Elevation:* 6,800 to 7,800 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 115 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from granitic rocks

**Beelem Series**

*Elevation:* 6,800 to 7,800 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 25 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from granitic rocks

***Dominant Present Vegetation***

Armoine: Black sagebrush, bottlebrush squirreltail  
 Beelem: Utah juniper, black sagebrush  
 Inclusion 1: Wyoming big sagebrush, spiny hopsage  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: None  
 Inclusion 4: Big sagebrush

***Ecological Site***

Armoine: 029XY014NV  
 Beelem: 029XY081NV  
 Inclusion 1: 029XY049NV  
 Inclusion 2: 027XY008NV  
 Inclusion 3: none  
 Inclusion 4: 029XY009NV

**2181--Armoine-Rock outcrop association**

***Composition***

**Major Components**  
 Armoine very gravelly sandy loam, 8 to 50 percent slopes--70 percent  
 Rock outcrop unweathered bedrock, 4 to 75 percent slopes--15 percent  
**Contrasting Inclusions**  
 Inclusion 1: Stewval very gravelly fine sandy loam, 8 to 30 percent slopes--8 percent  
 Inclusion 2: Zadvar very gravelly sandy loam, 2 to 15 percent slopes--4 percent  
 Inclusion 3: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic extremely gravelly loamy sand, 2 to 15 percent slopes--3 percent

***Map Unit Setting***

*Landscape position:* Hills and intermontane basins

Armoine--Landform: Hills  
 Rock outcrop--Landform: Hills; position on slope: areas of exposed rock  
 Inclusion 1--Landform: Hills  
 Inclusion 2--Landform: Fan remnants  
 Inclusion 3--Landform: Drainageways

#### ***Major Component Description***

##### **Armoine Series**

*Elevation:* 6,400 to 7,000 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 115 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Very gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Residuum and colluvium derived from granitic rocks

##### **Rock outcrop Miscellaneous Area**

*Elevation:* 6,400 to 7,000 feet  
*Surface layer texture:* Unweathered bedrock

#### ***Dominant Present Vegetation***

Armoine: Indian ricegrass, black sagebrush  
 Rock outcrop: None  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Black sagebrush  
 Inclusion 3: Big sagebrush

#### ***Ecological Site***

Armoine: 029XY014NV  
 Rock outcrop: None  
 Inclusion 1: 029XY008NV  
 Inclusion 2: 029XY008NV  
 Inclusion 3: 029XY009NV

### **2220--Enko-Orovada association**

#### ***Composition***

##### **Major Components**

Enko sandy loam, 0 to 2 percent slopes--45 percent  
 Orovada fine sandy loam, 0 to 2 percent slopes--40 percent

##### **Contrasting Inclusions**

Inclusion 1: Linoyer sandy loam, 0 to 2 percent slopes--5 percent  
 Inclusion 2: Rebel fine sandy loam, 0 to 4 percent slopes--5 percent  
 Inclusion 3: Defler sandy loam, 2 to 4 percent slopes--3 percent  
 Inclusion 4: Aridic Haploxerolls, loamy-skeletal, mixed, mesic sandy loam, 0 to 4 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Enko--Landform: Inset fans  
 Orovada--Landform: Inset fans; position on slope: upper

Inclusion 1--Landform: Inset fans; shape of slope: concave  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Inset fans; shape of slope: concave  
 Inclusion 4--Landform: Channels

#### ***Major Component Description***

##### **Enko Series**

*Elevation:* 6,500 to 6,800 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Orovada Series**

*Elevation:* 6,500 to 6,800 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Enko: Wyoming big sagebrush  
 Orovada: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 1: Winterfat  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Winterfat  
 Inclusion 4: Basin big sagebrush

#### ***Ecological Site***

Enko: 028BY010NV  
 Orovada: 028BY010NV  
 Inclusion 1: 028BY018NV  
 Inclusion 2: 028BY045NV  
 Inclusion 3: 028BY013NV  
 Inclusion 4: 028BY003NV

### **2230--Rotinom-Wholan association**

#### ***Composition***

##### **Major Components**

Rotinom silt loam, 0 to 2 percent slopes--50 percent  
 Wholan very fine sandy loam, 0 to 2 percent slopes--20 percent  
 Wholan very fine sandy loam, 0 to 2 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Rosney sandy loam, 0 to 2 percent slopes--6 percent

Inclusion 2: Typic Torrifluvents, coarse-loamy, mixed (calcareous), mesic sandy loam, 0 to 2 percent slopes--6 percent

Inclusion 3: Xeric Torrifluvents, fine-silty, mixed (calcareous), mesic sandy loam, 0 to 2 percent slopes--3 percent

### **Map Unit Setting**

*Landscape position:* Bolsons

Rotinom--Landform: Stream terraces

Wholan--Landform: Inset fans

Wholan--Landform: Inset fans

Inclusion 1--Landform: Alluvial flats

Inclusion 2--Landform: Stream terraces

Inclusion 3--Landform: Channels

### **Major Component Description**

#### **Rotinom Series**

*Elevation:* 6,500 to 6,600 feet

*Precipitation:* About 8 inches

*Air temperature:* About 45 degrees

*Frost-free season:* About 100 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Wholan Series**

*Elevation:* 6,500 to 6,600 feet

*Precipitation:* About 7 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Wholan Series**

*Elevation:* 6,500 to 6,600 feet

*Precipitation:* About 7 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### **Dominant Present Vegetation**

Rotinom: Shadscale

Wholan: Winterfat

Wholan: Sickle saltbush

Inclusion 1: Black greasewood

Inclusion 2: Black greasewood

Inclusion 3: Big sagebrush

### **Ecological Site**

Rotinom: 028BY017NV

Wholan: 028BY013NV

Wholan: 028BY047NV

Inclusion 1: 028BY069NV

Inclusion 2: 028BY069NV

Inclusion 3: 028BY028NV

## **2240--Unius-Orovada association**

### **Composition**

#### **Major Components**

Unius gravelly silt loam, 2 to 8 percent slopes--70 percent

Orovada fine sandy loam, 2 to 8 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Alley gravelly sandy loam, 2 to 8 percent slopes--6 percent

Inclusion 2: Rebel sandy loam, 0 to 4 percent slopes--5 percent

Inclusion 3: Defler gravelly sandy loam, 2 to 8 percent slopes--4 percent

### **Map Unit Setting**

*Landscape position:* Fan piedmonts

Unius--Landform: Fan remnants

Orovada--Landform: Inset fans

Inclusion 1--Landform: Fan remnants

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Inset fans; position on slope: upper

### **Major Component Description**

#### **Unius Series**

*Elevation:* 6,600 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 100 days

*Surface layer texture:* Gravelly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Orovada Series**

*Elevation:* 6,600 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

### **Dominant Present Vegetation**

Unius: Black sagebrush

Orovada: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 1: Wyoming big sagebrush

Inclusion 2: Wyoming big sagebrush

Inclusion 3: Winterfat

### **Ecological Site**

Unius: 028BY011NV

Orovada: 028BY010NV

Inclusion 1: 028BY010NV

Inclusion 2: 028BY045NV  
Inclusion 3: 028BY013NV

## 2241--Unius-Defler association

### *Composition*

#### **Major Components**

Unius gravelly silt loam, 2 to 8 percent slopes--55 percent  
Defler gravelly fine sandy loam, 2 to 4 percent slopes--30 percent

#### **Contrasting Inclusions**

Inclusion 1: Rebel fine sandy loam, 2 to 8 percent slopes--5 percent  
Inclusion 2: Ricert gravelly fine sandy loam, moist, 2 to 8 percent slopes--5 percent  
Inclusion 3: Xeric Torrifluvents, sandy-skeletal, mixed, mesic very gravelly loamy sand, 2 to 8 percent slopes--3 percent  
Inclusion 4: Duric Camborthids, coarse-loamy, mixed, mesic gravelly fine sandy loam, 2 to 8 percent slopes--2 percent

### *Map Unit Setting*

*Landscape position:* Fan piedmonts  
Unius--Landform: Fan remnants  
Defler--Landform: Inset fans  
Inclusion 1--Landform: Inset fans; position on slope: lower  
Inclusion 2--Landform: Fan remnants; position on slope: upper  
Inclusion 3--Landform: Channels  
Inclusion 4--Landform: Fan remnants; position on slope: lower

### *Major Component Description*

#### **Unius Series**

*Elevation:* 6,700 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 100 days  
*Surface layer texture:* Gravelly silt loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Defler Series**

*Elevation:* 6,700 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

### *Dominant Present Vegetation*

Unius: Black sagebrush  
Defler: Indian ricegrass, winterfat  
Inclusion 1: Wyoming big sagebrush

Inclusion 2: Bud sagebrush, shadscale  
Inclusion 3: Wyoming big sagebrush  
Inclusion 4: Galleta, shadscale

### *Ecological Site*

Unius: 028BY011NV  
Defler: 028BY013NV  
Inclusion 1: 028BY045NV  
Inclusion 2: 028BY017NV  
Inclusion 3: 028BY045NV  
Inclusion 4: 029XY017NV

## 2250--Muni-Orovada-Unius association

### *Composition*

#### **Major Components**

Muni fine sandy loam, 2 to 8 percent slopes--45 percent  
Orovada fine sandy loam, 2 to 4 percent slopes--30 percent  
Unius gravelly silt loam, 4 to 15 percent slopes--10 percent

#### **Contrasting Inclusions**

Inclusion 1: Alley gravelly sandy loam, 2 to 15 percent slopes--8 percent  
Inclusion 2: Zadvar very gravelly sandy loam, 4 to 30 percent slopes--5 percent  
Inclusion 3: Defler gravelly sandy loam, 2 to 8 percent slopes--2 percent

### *Map Unit Setting*

*Landscape position:* Fan piedmonts  
Muni--Landform: Fan remnants  
Orovada--Landform: Inset fans  
Unius--Landform: Fan remnants; geomorphic position: backslope  
Inclusion 1--Landform: Fan remnants; position on slope: lower  
Inclusion 2--Landform: Fan remnants; position on slope: lower  
Inclusion 3--Landform: Inset fans

### *Major Component Description*

#### **Muni Series**

*Elevation:* 6,600 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 46 degrees  
*Frost-free season:* About 100 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Orovada Series**

*Elevation:* 6,600 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Unius Series**

*Elevation:* 6,600 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 47 degrees

*Frost-free season:* About 100 days

*Surface layer texture:* Gravelly silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Muni: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail

Orovada: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail

Unius: Black sagebrush

Inclusion 1: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Black sagebrush, galleta

Inclusion 3: Winterfat

#### ***Ecological Site***

Muni: 028BY010NV

Orovada: 028BY010NV

Unius: 028BY011NV

Inclusion 1: 028BY010NV

Inclusion 2: 029XY008NV

Inclusion 3: 028BY013NV

## **2252--Muni-Alley-Rebel association**

#### ***Composition***

##### **Major Components**

Muni gravelly sandy loam, 2 to 8 percent slopes--40 percent

Alley gravelly sandy loam, 2 to 8 percent slopes--35 percent

Rebel very fine sandy loam, 2 to 4 percent slopes--10 percent

##### **Contrasting Inclusions**

Inclusion 1: Grassval very gravelly sandy loam, 2 to 8 percent slopes--6 percent

Inclusion 2: Watoopah gravelly sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 3: Linoyer sandy loam, 0 to 2 percent slopes--2 percent

Inclusion 4: Aridic Haploxerolls, loamy-skeletal, mixed, mesic sandy loam, 2 to 8 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Muni--Landform: Fan remnants

Alley--Landform: Fan remnants; position on slope: lower

Rebel--Landform: Inset fans

Inclusion 1--Landform: Fan remnants

Inclusion 2--Landform: Inset fans; position on slope: upper

Inclusion 3--Landform: Inset fans; position on slope: lower

Inclusion 4--Landform: Channels

#### ***Major Component Description***

##### **Muni Series**

*Elevation:* 6,600 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 46 degrees

*Frost-free season:* About 100 days

*Surface rock fragments:* 20 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Alley Series**

*Elevation:* 6,600 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

##### **Rebel Series**

*Elevation:* 6,600 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Very fine sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Muni: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail

Alley: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail

Rebel: Wyoming big sagebrush

Inclusion 1: Black sagebrush

Inclusion 2: Indian ricegrass, Wyoming big sagebrush, galleta

Inclusion 3: Winterfat

Inclusion 4: Basin big sagebrush

#### ***Ecological Site***

Muni: 028BY010NV

Alley: 028BY010NV

Rebel: 028BY045NV

Inclusion 1: 028BY011NV

Inclusion 2: 029XY049NV

Inclusion 3: 028BY013NV

Inclusion 4: 028BY003NV

**2271--Buffaran-Wieland association*****Composition*****Major Components**

Buffaran cobbly loam, 2 to 8 percent slopes--50 percent

Wieland gravelly loam, 8 to 15 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Alley gravelly sandy loam, 2 to 8 percent slopes--6 percent

Inclusion 2: Hooplite cobbly sandy loam, 4 to 30 percent slopes--3 percent

Inclusion 3: Grassval cobbly sandy loam, 2 to 8 percent slopes--1 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts

Buffaran--Landform: Fan remnants

Wieland--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Fan remnants; position on slope: lower

Inclusion 2--Landform:

Inclusion 3--Landform: Fan remnants

***Major Component Description*****Buffaran Series**

*Elevation:* 6,200 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 110 days

*Surface rock fragments:* 10 percent cobbles; 10 percent gravel

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Wieland Series**

*Elevation:* 6,200 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 25 percent gravel

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Buffaran: Wyoming big sagebrush

Wieland: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 1: Wyoming big sagebrush, bottlebrush squirreltail

Inclusion 2: Black sagebrush

Inclusion 3: Black sagebrush

***Ecological Site***

Buffaran: 028BY010NV

Wieland: 028BY010NV

Inclusion 1: 028BY010NV

Inclusion 2: 028BY011NV

Inclusion 3: 028BY011NV

**2272--Buffaran-Pineval association*****Composition*****Major Components**

Buffaran gravelly loam, 4 to 15 percent slopes--70 percent

Pineval gravelly loam, 15 to 30 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic very gravelly sandy loam, 2 to 8 percent slopes--8 percent

Inclusion 2: Lithic Xerollic Haplargids, loamy-skeletal, mixed, mesic cobbly loam, 2 to 15 percent slopes--4 percent

Inclusion 3: Grassval very gravelly sandy loam, 2 to 8 percent slopes--3 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts

Buffaran--Landform: Fan remnants

Pineval--Landform: Fan remnants; geomorphic position: backslope

Inclusion 1--Landform: Inset fans

Inclusion 2--Landform: Pediments

Inclusion 3--Landform: Fan remnants; position on slope: lower

***Major Component Description*****Buffaran Series**

*Elevation:* 6,200 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 110 days

*Surface rock fragments:* 25 percent gravel

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Pineval Series**

*Elevation:* 6,200 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 10 percent cobbles; 30 percent gravel

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Buffaran: Wyoming big sagebrush

Pineval: Wyoming big sagebrush

Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Black sagebrush

**Ecological Site**

Buffaran: 028BY010NV  
 Pineval: 028BY010NV  
 Inclusion 1: 028BY010NV  
 Inclusion 2: 028BY010NV  
 Inclusion 3: 028BY011NV

**2290--Spaspfrey-Alley association**

**Composition**

**Major Components**

Spaspfrey gravelly fine sandy loam, 2 to 4 percent slopes--50 percent  
 Alley gravelly loam, 2 to 8 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, loamy-skeletal, mixed (calcareous), mesic fine sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 2: Rebel sandy loam, 2 to 4 percent slopes--5 percent  
 Inclusion 3: Dewar very cobbly sandy loam, 2 to 8 percent slopes--3 percent  
 Inclusion 4: Grassval gravelly fine sandy loam, 2 to 8 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Spaspfrey--Landform: Fan remnants; geomorphic position: summit  
 Alley--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Fan remnants  
 Inclusion 4--Landform: Fan remnants

**Major Component Description**

**Spaspfrey Series**

*Elevation:* 6,300 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Alley Series**

*Elevation:* 6,300 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Dominant Present Vegetation**

Spaspfrey: Wyoming big sagebrush  
 Alley: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 4: Black sagebrush

**Ecological Site**

Spaspfrey: 028BY010NV  
 Alley: 028BY010NV  
 Inclusion 1: 028BY045NV  
 Inclusion 2: 028BY045NV  
 Inclusion 3: 028BY080NV  
 Inclusion 4: 028BY011NV

**2291--Spaspfrey-Buffaran-Orovada association**

**Composition**

**Major Components**

Spaspfrey gravelly fine sandy loam, 0 to 2 percent slopes--35 percent  
 Buffaran very gravelly fine sandy loam, 2 to 8 percent slopes--35 percent  
 Orovada fine sandy loam, 2 to 4 percent slopes--15 percent

**Contrasting Inclusions**

Inclusion 1: Rebel sandy loam, 0 to 2 percent slopes--8 percent  
 Inclusion 2: Kelk sandy loam, moist, 0 to 2 percent slopes--7 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Spaspfrey--Landform: Fan remnants; geomorphic position: summit  
 Buffaran--Landform: Fan remnants; geomorphic position: shoulder  
 Orovada--Landform: Inset fans  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Inset fans; position on slope: lower

**Major Component Description**

**Spaspfrey Series**

*Elevation:* 6,300 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Buffaran Series**

*Elevation:* 6,300 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 25 percent gravel

*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### **Orovada Series**

*Elevation:* 6,300 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Spasprey: Wyoming big sagebrush  
 Buffaran: Wyoming big sagebrush  
 Orovada: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Wyoming big sagebrush

#### ***Ecological Site***

Spasprey: 028BY010NV  
 Buffaran: 028BY010NV  
 Orovada: 028BY010NV  
 Inclusion 1: 028BY045NV  
 Inclusion 2: 028BY045NV

### **2300--Kelk-Settlemeier association**

#### ***Composition***

##### **Major Components**

Kelk very fine sandy loam, 0 to 2 percent slopes--55 percent  
 Settlemeier fine sandy loam, 0 to 2 percent slopes--30 percent

##### **Contrasting Inclusions**

Inclusion 1: Kelk sandy loam, 0 to 4 percent slopes--9 percent  
 Inclusion 2: Rose Creek gravelly loam, 0 to 4 percent slopes, frequently flooded--6 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Kelk--Landform: Stream terraces  
 Settlemeier--Landform: Stream terraces; position on slope: lower  
 Inclusion 1--Landform: Stream terraces  
 Inclusion 2--Landform: Channels

#### ***Major Component Description***

##### **Kelk Series**

*Elevation:* 6,000 to 6,300 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Settlemeier Series**

*Elevation:* 6,000 to 6,300 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Fine sandy loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Kelk: Basin big sagebrush, black greasewood  
 Settlemeier: Basin big sagebrush, basin wildrye  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Willow

#### ***Ecological Site***

Kelk: 028BY028NV  
 Settlemeier: 028BY003NV  
 Inclusion 1: 028BY045NV  
 Inclusion 2: 028BY081NV

### **2320--Rosney-Kelk association**

#### ***Composition***

##### **Major Components**

Rosney silt loam, 0 to 2 percent slopes--30 percent  
 Kelk silt loam, 0 to 4 percent slopes--30 percent  
 Kelk silt loam, 0 to 4 percent slopes--25 percent

##### **Contrasting Inclusions**

Inclusion 1: Xeric Torrifluvents, fine, montmorillonitic (calcareous), mesic silty clay loam, 0 to 2 percent slopes--9 percent  
 Inclusion 2: Dunphy sandy loam, 0 to 2 percent slopes--3 percent  
 Inclusion 3: Linoyer sandy loam, 0 to 2 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Rosney--Landform: Alluvial flats  
 Kelk--Landform: Fan skirts; position on slope: lower  
 Kelk--Landform: Fan skirts  
 Inclusion 1--Landform: Channels  
 Inclusion 2--Landform: Alluvial flats; position on slope: lower  
 Inclusion 3--Landform: Inset fans

#### ***Major Component Description***

##### **Rosney Series**

*Elevation:* 6,800 to 7,000 feet  
*Precipitation:* About 8 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Kelk Series**

*Elevation:* 6,800 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Kelk Series**

*Elevation:* 6,800 to 7,000 feet

*Precipitation:* About 10 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Rosney: Bottlebrush squirreltail

Kelk: Wyoming big sagebrush, black greasewood

Kelk: Indian ricegrass, Wyoming big sagebrush

Inclusion 1: Basin big sagebrush, black greasewood

Inclusion 2: Black greasewood, rubber rabbitbrush

Inclusion 3: Winterfat

#### ***Ecological Site***

Rosney: 028BY069NV

Kelk: 028BY028NV

Kelk: 028BY045NV

Inclusion 1: 028BY041NV

Inclusion 2: 028BY004NV

Inclusion 3: 028BY013NV

### **2321--Rosney-Dunphy-Paranat association**

#### ***Composition***

##### **Major Components**

Rosney silt loam, 0 to 2 percent slopes--35 percent

Dunphy silt loam, 0 to 2 percent slopes--30 percent

Paranat silt loam, 0 to 2 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Typic Torrifluvents, fine, montmorillonitic (calcareous), mesic silty clay loam, 0 to 2 percent slopes--5 percent

Inclusion 2: Aquolls, 0 to 2 percent slopes--4 percent

Inclusion 3: Kelk sandy loam, 0 to 4 percent slopes--3 percent

Inclusion 4: Aquolls, 0 to 2 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons

Rosney--Landform: Alluvial flats

Dunphy--Landform: Alluvial flats

Paranat--Landform: Alluvial flats; position on slope: lower

Inclusion 1--Landform: Alluvial flats; position on slope: upper

Inclusion 2--Landform: Alluvial flats

Inclusion 3--Landform: Alluvial flats

Inclusion 4--Landform: Alluvial flats

#### ***Major Component Description***

##### **Rosney Series**

*Elevation:* 6,800 to 7,000 feet

*Precipitation:* About 8 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Silt loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Dunphy Series**

*Elevation:* 6,700 to 7,000 feet

*Precipitation:* About 8 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 105 days

*Surface layer texture:* Silt loam

*Drainage class:* Somewhat poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

##### **Paranat Series**

*Elevation:* 6,700 to 7,000 feet

*Precipitation:* About 9 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Silt loam

*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Rosney: Bottlebrush squirreltail, inland saltgrass

Dunphy: Black greasewood, inland saltgrass, rubber rabbitbrush

Paranat: Baltic rush, alkali sacaton, inland saltgrass

Inclusion 1: Black greasewood

Inclusion 2: Baltic rush

Inclusion 3: Wyoming big sagebrush, black greasewood

Inclusion 4: Cattail

#### ***Ecological Site***

Rosney: 028BY069NV

Dunphy: 028BY004NV

Paranat: 028BY002NV

Inclusion 1: 028BY020NV

Inclusion 2: 028BY012NV

Inclusion 3: 028BY028NV

Inclusion 4: 028BY044NV

**2330--Cliffdown-Lyx association****Composition****Major Components**

Cliffdown gravelly sandy loam, 2 to 8 percent slopes--50 percent

Lyx gravelly loamy sand, 2 to 8 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Leo very gravelly loamy sand, 2 to 8 percent slopes--6 percent

Inclusion 2: Xeric Torriorthents very gravelly sandy loam, 2 to 8 percent slopes--2 percent

Inclusion 3: Izo very gravelly loamy sand, 2 to 4 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Cliffdown--Landform: Inset fans; position on slope: lower

Lyx--Landform: Inset fans

Inclusion 1--Landform: Inset fans; position on slope: upper

Inclusion 2--Landform: Inset fans

Inclusion 3--Landform: Channels

**Major Component Description****Cliffdown Series**

*Elevation:* 5,800 to 6,800 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 30 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Lyx Series**

*Elevation:* 5,800 to 6,800 feet

*Precipitation:* About 6 inches

*Air temperature:* About 53 degrees

*Frost-free season:* About 130 days

*Surface rock fragments:* 35 percent gravel

*Surface layer texture:* Gravelly loamy sand

*Drainage class:* Somewhat excessively drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Cliffdown: Bud sagebrush, winterfat

Lyx: Fourwing saltbush, galleta

Inclusion 1: Spiny hopsage

Inclusion 2: Black sagebrush

Inclusion 3: Burrobrush

**Ecological Site**

Cliffdown: 029XY042NV

Lyx: 029XY046NV

Inclusion 1: 029XY016NV

Inclusion 2: 029XY008NV

Inclusion 3: 029XY041NV

**2340--Alley-Portmount-Rebel association****Composition****Major Components**

Alley gravelly sandy loam, 0 to 8 percent slopes--40 percent

Portmount sandy loam, 0 to 8 percent slopes--30 percent

Rebel sandy loam, 0 to 8 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, coarse-loamy, mixed (calcareous), mesic fine sandy loam, 0 to 4 percent slopes--3 percent

Inclusion 2: Xeric Torriorthents, sandy-skeletal, mixed, mesic loamy sand, 0 to 4 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts

Alley--Landform: Fan remnants

Portmount--Landform: Fan remnants; position on slope: lower

Rebel--Landform: Inset fans

Inclusion 1--Landform: Channels; position on slope: lower

Inclusion 2--Landform: Channels

**Major Component Description****Alley Series**

*Elevation:* 6,700 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 20 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Portmount Series**

*Elevation:* 6,700 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

**Rebel Series**

*Elevation:* 6,700 to 7,200 feet

*Precipitation:* About 9 inches

*Air temperature:* About 52 degrees

*Frost-free season:* About 110 days

*Surface layer texture:* Sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Alley: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail, needleandthread  
 Portmount: Indian ricegrass, Wyoming big sagebrush, needleandthread  
 Rebel: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 1: Basin wildrye  
 Inclusion 2: Indian ricegrass, Wyoming big sagebrush, basin wildrye

***Ecological Site***

Alley: 028BY010NV  
 Portmount: 028BY010NV  
 Rebel: 028BY045NV  
 Inclusion 1: 028BY003NV  
 Inclusion 2: 028BY045NV

**2341--Alley-Wiffo-Wrango association*****Composition*****Major Components**

Alley gravelly sandy loam, 2 to 8 percent slopes--35 percent  
 Wiffo very gravelly loam, 2 to 8 percent slopes--30 percent  
 Wrango gravelly fine sandy loam, 2 to 8 percent slopes--20 percent

**Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, sandy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Duric Camborthids, coarse-loamy, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--4 percent  
 Inclusion 3: Shabliss very gravelly sandy loam, 2 to 4 percent slopes--3 percent  
 Inclusion 4: Defler gravelly loam, 2 to 8 percent slopes--2 percent

***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Alley--Landform: Fan remnants  
 Wiffo--Landform: Inset fans  
 Wrango--Landform: Inset fans; position on slope: upper  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Fan remnants; position on slope: lower  
 Inclusion 4--Landform: Inset fans

***Major Component Description*****Alley Series**

*Elevation:* 6,800 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Wiffo Series**

*Elevation:* 6,800 to 7,400 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Very gravelly loam  
*Drainage class:* Somewhat excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Wrango Series**

*Elevation:* 6,800 to 7,400 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 52 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 35 percent gravel  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Excessively drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Alley: Wyoming big sagebrush, bottlebrush squirreltail, rabbitbrush  
 Wiffo: Wyoming big sagebrush  
 Wrango: Indian ricegrass, black sagebrush, needleandthread, winterfat  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Bud sagebrush  
 Inclusion 3: Winterfat

***Ecological Site***

Alley: 028BY010NV  
 Wiffo: 028BY080NV  
 Wrango: 028BY011NV  
 Inclusion 1: 029XY006NV  
 Inclusion 2: 028BY017NV  
 Inclusion 3: 028BY013NV  
 Inclusion 4: 028BY080NV

**2342--Alley-Kelk association*****Composition*****Major Components**

Alley gravelly loam, 2 to 4 percent slopes--50 percent  
 Kelk very fine sandy loam, 0 to 2 percent slopes--35 percent

**Contrasting Inclusions**

Inclusion 1: Rebel fine sandy loam, 0 to 4 percent slopes--8 percent  
 Inclusion 2: Portmount gravelly sandy loam, 0 to 4 percent slopes--5 percent  
 Inclusion 3: Mosida sandy loam, 0 to 4 percent slopes--2 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Alley--Landform: Fan remnants  
 Kelk--Landform: Inset fans  
 Inclusion 1--Landform: Inset fans; position on slope:  
 lower  
 Inclusion 2--Landform: Inset fans; position on slope:  
 upper  
 Inclusion 3--Landform: Channels

**Major Component Description****Alley Series**

*Elevation:* 6,400 to 6,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium  
 derived from mixed rocks

**Kelk Series**

*Elevation:* 6,400 to 6,600 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Very fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks

**Dominant Present Vegetation**

Alley: Indian ricegrass, Wyoming big sagebrush,  
 bottlebrush squirreltail, needleandthread  
 Kelk: Wyoming big sagebrush  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 3: Basin big sagebrush, basin wildrye

**Ecological Site**

Alley: 028BY010NV  
 Kelk: 028BY045NV  
 Inclusion 1: 028BY045NV  
 Inclusion 2: 028BY010NV  
 Inclusion 3: 028BY003NV

**2343--Alley-Pineval-Portmount association****Composition****Major Components**

Alley gravelly sandy loam, 2 to 8 percent slopes--40  
 percent  
 Pineval gravelly loam, 2 to 15 percent slopes--25  
 percent  
 Portmount gravelly sandy loam, 2 to 8 percent slopes--  
 20 percent

**Contrasting Inclusions**

Inclusion 1: Rebel sandy loam, 2 to 8 percent slopes--5  
 percent

Inclusion 2: Ricert gravelly sandy loam, moist, 2 to 8  
 percent slopes--4 percent  
 Inclusion 3: Xeric Torriorthents very cobbly loam, 8 to  
 50 percent slopes--4 percent  
 Inclusion 4: Aridic Haploxerolls, loamy-skeletal, mixed,  
 mesic gravelly loam, 2 to 8 percent slopes--2  
 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Alley--Landform: Fan remnants; position on slope:  
 upper  
 Pineval--Landform: Fan remnants; position on slope:  
 lower  
 Portmount--Landform: Fan remnants  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Fan remnants; position on  
 slope: lower  
 Inclusion 3--Landform: Fan remnants  
 Inclusion 4--Landform: Inset fans

**Major Component Description****Alley Series**

*Elevation:* 6,200 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium  
 derived from mixed rocks

**Pineval Series**

*Elevation:* 6,200 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 10 percent cobbles; 30  
 percent gravel  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks

**Portmount Series**

*Elevation:* 6,200 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed  
 rocks

**Dominant Present Vegetation**

Alley: Indian ricegrass, Wyoming big sagebrush,  
 bottlebrush squirreltail, needleandthread  
 Pineval: Wyoming big sagebrush, bottlebrush  
 squirreltail  
 Portmount: Indian ricegrass, Wyoming big sagebrush,  
 needleandthread

Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Bottlebrush squirreltail, shadscale  
 Inclusion 3: Wyoming big sagebrush  
 Inclusion 4: Basin big sagebrush

#### ***Ecological Site***

Alley: 028BY010NV  
 Pineval: 028BY010NV  
 Portmount: 028BY010NV  
 Inclusion 1: 028BY045NV  
 Inclusion 2: 028BY017NV  
 Inclusion 3: 028BY080NV  
 Inclusion 4: 028BY003NV

### **2344--Alley-Bufferan-Spasprey association**

#### ***Composition***

##### **Major Components**

Alley gravelly sandy loam, 2 to 8 percent slopes--45 percent  
 Bufferan gravelly loam, 2 to 8 percent slopes--20 percent  
 Spasprey gravelly fine sandy loam, 2 to 8 percent slopes--20 percent

##### **Contrasting Inclusions**

Inclusion 1: Xerollic Camborthids, loamy-skeletal, mixed, mesic very gravelly sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 2: Aridic Haploxerolls, loamy-skeletal, mixed, mesic gravelly loam, 2 to 8 percent slopes--3 percent  
 Inclusion 3: Dewar very cobbly sandy loam, 2 to 8 percent slopes--3 percent  
 Inclusion 4: Xeric Torriorthents, sandy-skeletal, mixed, mesic extremely cobbly loam, 8 to 50 percent slopes--3 percent

#### ***Map Unit Setting***

*Landscape position:* Fan piedmonts  
 Alley--Landform: Fan remnants  
 Bufferan--Landform: Fan remnants; geomorphic position: summit  
 Spasprey--Landform: Fan remnants; position on slope: upper  
 Inclusion 1--Landform: Inset fans  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Fan remnants; geomorphic position: shoulder  
 Inclusion 4--Landform: Fan remnants

#### ***Major Component Description***

##### **Alley Series**

*Elevation:* 6,200 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

##### **Bufferan Series**

*Elevation:* 6,200 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

##### **Spasprey Series**

*Elevation:* 6,200 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Alley: Indian ricegrass, Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, needleandthread  
 Bufferan: Wyoming big sagebrush  
 Spasprey: Wyoming big sagebrush  
 Inclusion 1: Indian ricegrass, Wyoming big sagebrush  
 Inclusion 4: Wyoming big sagebrush

#### ***Ecological Site***

Alley: 028BY010NV  
 Bufferan: 028BY010NV  
 Spasprey: 028BY010NV  
 Inclusion 1: 028BY045NV  
 Inclusion 2: 028BY003NV  
 Inclusion 3: 028BY080NV  
 Inclusion 4: 028BY010NV

### **2345--Alley-Wieland-Pineval association**

#### ***Composition***

##### **Major Components**

Alley gravelly loam, 2 to 15 percent slopes--40 percent  
 Wieland gravelly loam, 4 to 30 percent slopes--30 percent  
 Pineval gravelly loam, 4 to 15 percent slopes--15 percent

##### **Contrasting Inclusions**

Inclusion 1: Xeric Torriorthents, sandy-skeletal, mixed, mesic cobbly loam, 15 to 50 percent slopes--5 percent  
 Inclusion 2: Rebel gravelly sandy loam, 2 to 8 percent slopes--5 percent  
 Inclusion 3: Zaidy very gravelly sandy loam, 2 to 80 percent slopes--4 percent  
 Inclusion 4: Aridic Haploxerolls gravelly sandy loam, 2 to 8 percent slopes--1 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Alley--Landform: Fan remnants  
 Wieland--Landform: Fan remnants; geomorphic position: backslope  
 Pineval--Landform: Fan remnants; geomorphic position: backslope; position on slope: lower  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Inset fans  
 Inclusion 3--Landform: Fan remnants; geomorphic position: shoulder  
 Inclusion 4--Landform: Inset fans

**Major Component Description****Alley Series**

*Elevation:* 6,300 to 7,100 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Wieland Series**

*Elevation:* 6,300 to 7,100 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 25 percent gravel  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Pineval Series**

*Elevation:* 6,300 to 7,000 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 30 percent cobbles; 20 percent gravel  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Alley: Indian ricegrass, Wyoming big sagebrush, bluegrass, bottlebrush squirreltail, needleandthread  
 Wieland: Wyoming big sagebrush, bottlebrush squirreltail  
 Pineval: Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 1: Wyoming big sagebrush  
 Inclusion 2: Wyoming big sagebrush  
 Inclusion 3: Black sagebrush  
 Inclusion 4: Basin big sagebrush

**Ecological Site**

Alley: 028BY010NV

Wieland: 028BY010NV  
 Pineval: 028BY010NV  
 Inclusion 1: 028BY080NV  
 Inclusion 2: 028BY045NV  
 Inclusion 3: 028BY011NV  
 Inclusion 4: 028BY003NV

**2360--Dewar-Alley association****Composition****Major Components**

Dewar gravelly loam, 2 to 8 percent slopes--45 percent  
 Alley gravelly sandy loam, 2 to 8 percent slopes--40 percent

**Contrasting Inclusions**

Inclusion 1: Rebel sandy loam, 2 to 4 percent slopes--6 percent  
 Inclusion 2: Grassval very gravelly sandy loam, 2 to 8 percent slopes--6 percent  
 Inclusion 3: Defler very gravelly sandy loam, 2 to 8 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Dewar--Landform: Fan remnants; geomorphic position: summit  
 Alley--Landform: Fan remnants  
 Inclusion 1--Landform: Inset fans; position on slope: lower  
 Inclusion 2--Landform: Fan remnants; position on slope: upper  
 Inclusion 3--Landform: Inset fans

**Major Component Description****Dewar Series**

*Elevation:* 6,900 to 7,400 feet  
*Precipitation:* About 10 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 40 percent gravel  
*Surface layer texture:* Gravelly loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Alley Series**

*Elevation:* 6,850 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Dominant Present Vegetation**

Dewar: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail

Alley: Wyoming big sagebrush, bottlebrush squirreltail, rabbitbrush

Inclusion 1: Wyoming big sagebrush

Inclusion 2: Black sagebrush

Inclusion 3: Winterfat

### ***Ecological Site***

Dewar: 028BY010NV

Alley: 028BY010NV

Inclusion 1: 028BY045NV

Inclusion 2: 028BY011NV

Inclusion 3: 028BY013NV

## **2361--Dewar-Shabliss-Alley association**

### ***Composition***

#### **Major Components**

Dewar cobbly loam, 2 to 8 percent slopes--35 percent

Shabliss gravelly loam, 2 to 15 percent slopes--35 percent

Alley gravelly sandy loam, 2 to 8 percent slopes--15 percent

#### **Contrasting Inclusions**

Inclusion 1: Durixerollic Camborthids, coarse-loamy, mixed, mesic loamy sand, 2 to 8 percent slopes--5 percent

Inclusion 2: Grassval very gravelly sandy loam, 2 to 8 percent slopes--5 percent

Inclusion 3: Defler sandy loam, 2 to 4 percent slopes--3 percent

Inclusion 4: Duric Camborthids, coarse-loamy, mixed, mesic gravelly sandy loam, 2 to 8 percent slopes--2 percent

### ***Map Unit Setting***

*Landscape position:* Fan piedmonts

Dewar--Landform: Fan remnants; geomorphic position: summit

Shabliss--Landform: Fan remnants; geomorphic position: shoulder

Alley--Landform: Fan remnants; position on slope: lower

Inclusion 1--Landform: Inset fans; position on slope: lower

Inclusion 2--Landform: Fan remnants; position on slope: upper

Inclusion 3--Landform: Inset fans

Inclusion 4--Landform: Inset fans; position on slope: lower

### ***Major Component Description***

#### **Dewar Series**

*Elevation:* 6,800 to 7,400 feet

*Precipitation:* About 10 inches

*Air temperature:* About 48 degrees

*Frost-free season:* About 110 days

*Surface rock fragments:* 20 percent cobbles; 20 percent gravel

*Surface layer texture:* Cobbly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Shabliss Series**

*Elevation:* 6,800 to 7,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 49 degrees

*Frost-free season:* About 120 days

*Surface layer texture:* Gravelly loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### **Alley Series**

*Elevation:* 6,800 to 7,400 feet

*Precipitation:* About 9 inches

*Air temperature:* About 50 degrees

*Frost-free season:* About 120 days

*Surface rock fragments:* 20 percent gravel

*Surface layer texture:* Gravelly sandy loam

*Drainage class:* Well drained

*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

### ***Dominant Present Vegetation***

Dewar: Wyoming big sagebrush

Shabliss: Indian ricegrass

Alley: Wyoming big sagebrush, bottlebrush squirreltail, rabbitbrush

Inclusion 1: Wyoming big sagebrush

Inclusion 2: Black sagebrush

Inclusion 3: Winterfat

Inclusion 4: Galleta

### ***Ecological Site***

Dewar: 028BY010NV

Shabliss: 028BY080NV

Alley: 028BY010NV

Inclusion 1: 028BY045NV

Inclusion 2: 028BY011NV

Inclusion 3: 028BY013NV

Inclusion 4: 029XY017NV

## **2400--Zaidy-Alley-Portmount association**

### ***Composition***

#### **Major Components**

Zaidy very gravelly fine sandy loam, 2 to 8 percent slopes--35 percent

Alley gravelly sandy loam, 2 to 8 percent slopes--30 percent

Portmount gravelly sandy loam, 2 to 8 percent slopes--20 percent

#### **Contrasting Inclusions**

Inclusion 1: Durixerollic Haplargids, loamy-skeletal, mixed, mesic, 2 to 8 percent slopes--8 percent

Inclusion 2: Rebel gravelly sandy loam, 2 to 4 percent slopes--7 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Zaidy--Landform: Fan remnants; geomorphic position: summit  
 Alley--Landform: Fan remnants  
 Portmount--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Fan remnants  
 Inclusion 2--Landform: Inset fans

**Major Component Description****Zaidy Series**

*Elevation:* 7,000 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 5 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Alley Series**

*Elevation:* 7,000 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

**Portmount Series**

*Elevation:* 7,000 to 7,200 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 110 days  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Dominant Present Vegetation**

Zaidy: Indian ricegrass, black sagebrush, bottlebrush squirreltail, needleandthread  
 Alley: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail, rabbitbrush  
 Portmount: Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail  
 Inclusion 1: Black sagebrush  
 Inclusion 2: Wyoming big sagebrush

**Ecological Site**

Zaidy: 028BY011NV  
 Alley: 028BY010NV  
 Portmount: 028BY010NV  
 Inclusion 1: 028BY011NV  
 Inclusion 2: 028BY045NV

**2401--Zaidy-Ricert-Alley association****Composition****Major Components**

Zaidy very gravelly fine sandy loam, 2 to 8 percent slopes--30 percent  
 Ricert gravelly sandy loam, 2 to 8 percent slopes--30 percent  
 Alley gravelly sandy loam, 2 to 8 percent slopes--25 percent

**Contrasting Inclusions**

Inclusion 1: Ricert very gravelly fine sandy loam, dry, 2 to 8 percent slopes--8 percent  
 Inclusion 2: Rebel sandy loam, 2 to 4 percent slopes--4 percent  
 Inclusion 3: Defler silt loam, 2 to 8 percent slopes--3 percent

**Map Unit Setting**

*Landscape position:* Fan piedmonts  
 Zaidy--Landform: Fan remnants; geomorphic position: summit  
 Ricert--Landform: Fan remnants; geomorphic position: shoulder  
 Alley--Landform: Fan remnants; position on slope: lower  
 Inclusion 1--Landform: Fan remnants; geomorphic position: shoulder; position on slope: upper  
 Inclusion 2--Landform: Inset fans; position on slope: lower  
 Inclusion 3--Landform: Inset fans

**Major Component Description****Zaidy Series**

*Elevation:* 6,600 to 6,900 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 110 days  
*Surface rock fragments:* 5 percent cobbles; 40 percent gravel  
*Surface layer texture:* Very gravelly fine sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Ricert Series**

*Elevation:* 6,000 to 6,800 feet  
*Precipitation:* About 8 inches  
*Air temperature:* About 48 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 5 percent cobbles; 30 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium derived from mixed rocks

**Alley Series**

*Elevation:* 6,000 to 6,900 feet  
*Precipitation:* About 9 inches

*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface rock fragments:* 20 percent gravel  
*Surface layer texture:* Gravelly sandy loam  
*Drainage class:* Well drained  
*Dominant parent material:* Alluvium and colluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

*Zaidy:* Indian ricegrass, black sagebrush, bottlebrush squirreltail, needleandthread  
*Ricert:* Indian ricegrass, bud sagebrush, shadscale  
*Alley:* Indian ricegrass, Wyoming big sagebrush, bottlebrush squirreltail, needleandthread  
*Inclusion 1:* Bailey greasewood, bottlebrush squirreltail, shadscale  
*Inclusion 2:* Wyoming big sagebrush  
*Inclusion 3:* Winterfat

#### ***Ecological Site***

*Zaidy:* 028BY011NV  
*Ricert:* 028BY017NV  
*Alley:* 028BY010NV  
*Inclusion 1:* 027XY018NV  
*Inclusion 2:* 028BY045NV  
*Inclusion 3:* 028BY013NV

### **2410--Settlemeier silt loam, 2 to 4 percent slopes**

#### ***Composition***

##### **Major Components**

Settlemeier silt loam, 2 to 4 percent slopes--85 percent

##### **Contrasting Inclusions**

*Inclusion 1:* Aquic Torriorthents, coarse-loamy, mixed (calcareous), mesic sandy loam, 0 to 8 percent slopes--5 percent  
*Inclusion 2:* Aquolls, 0 to 85 percent slopes--5 percent  
*Inclusion 3:* Rose Creek loam, 0 to 4 percent slopes, Frequently flooded--5 percent

#### ***Map Unit Setting***

*Landscape position:* Bolsons  
 Settlemeier--Landform: Stream terraces  
 Inclusion 1--Landform: Stream terraces  
 Inclusion 2--Landform: Stream terraces; position on slope: lower  
 Inclusion 3--Landform: Stream terraces; position on slope: lower

#### ***Major Component Description***

##### **Settlemeier Series**

*Elevation:* 6,300 to 6,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 47 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Poorly drained

*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Settlemeier: Nevada bluegrass, sedge  
 Inclusion 1: Alkali sacaton  
 Inclusion 2: Bulrush  
 Inclusion 3: Willow

#### ***Ecological Site***

Settlemeier: 028BY001NV  
 Inclusion 1: 028BY002NV  
 Inclusion 2: 028BY044NV  
 Inclusion 3: 028BY081NV

### **2430--Rose Creek loam, 0 to 2 percent slopes**

#### ***Composition***

##### **Major Components**

Rose Creek loam, 0 to 2 percent slopes--85 percent

##### **Contrasting Inclusions**

*Inclusion 1:* Aquolls, 0 to 8 percent slopes--8 percent  
*Inclusion 2:* Aquic Xerofluvents, sandy-skeletal, mixed, mesic, 0 to 4 percent slopes--5 percent  
*Inclusion 3:* Xeric Torrifluvents, loamy-skeletal, mixed (calcareous), mesic sandy loam, 15 to 75 percent slopes--2 percent

#### ***Map Unit Setting***

*Landscape position:* Semi-bolsons  
 Rose Creek--Landform: Stream terraces  
 Inclusion 1--Landform: Stream terraces  
 Inclusion 2--Landform: Channels  
 Inclusion 3--Landform: Stream terraces; position on slope: upper

#### ***Major Component Description***

##### **Rose Creek Series**

*Elevation:* 6,400 to 6,800 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

#### ***Dominant Present Vegetation***

Rose Creek: Baltic rush, alkali sacaton  
 Inclusion 1: Cattail  
 Inclusion 2: Willow  
 Inclusion 3: Basin big sagebrush

#### ***Ecological Site***

Rose Creek: 028BY002NV  
 Inclusion 1: 028BY044NV  
 Inclusion 2: 028BY081NV  
 Inclusion 3: 028BY081NV

**2431--Rose Creek loam, 0 to 2 percent slopes, frequently flooded**

***Composition***

**Major Components**

Rose Creek loam, 0 to 2 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Aquolls, 0 to 2 percent slopes--9 percent  
Inclusion 2: Aquic Xerofluvents, sandy-skeletal, mixed, mesic, 0 to 8 percent slopes--6 percent

***Map Unit Setting***

*Landscape position:* Semi-bolsons  
Rose Creek--Landform: Stream terraces  
Inclusion 1--Landform: Stream terraces  
Inclusion 2--Landform: Channels

***Major Component Description***

**Rose Creek Series**

*Elevation:* 6,400 to 6,600 feet  
*Precipitation:* About 6 inches  
*Air temperature:* About 50 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Rose Creek: Creeping wildrye, inland saltgrass, willow  
Inclusion 1: Nevada bluegrass, rose, sedge, willow, willow  
Inclusion 2: Willow

***Ecological Site***

Rose Creek: 028BY081NV  
Inclusion 1: 028BY001NV  
Inclusion 2: 028BY081NV

**2440--Paranat silt loam, 0 to 2 percent slopes**

***Composition***

**Major Components**

Paranat silt loam, 0 to 2 percent slopes--85 percent

**Contrasting Inclusions**

Inclusion 1: Aquolls, 0 to 4 percent slopes--6 percent  
Inclusion 2: Aquic Torriorthents, 0 to 8 percent slopes--6 percent  
Inclusion 3: Rose Creek loam, 0 to 4 percent slopes, frequently flooded--3 percent

***Map Unit Setting***

*Landscape position:* Semi-bolsons  
Paranat--Landform: Stream terraces  
Inclusion 1--Landform: Stream terraces  
Inclusion 2--Landform: Stream terraces; position on slope: lower  
Inclusion 3--Landform: Channels

***Major Component Description***

**Paranat Series**

*Elevation:* 6,400 to 6,600 feet  
*Precipitation:* About 9 inches  
*Air temperature:* About 49 degrees  
*Frost-free season:* About 120 days  
*Surface layer texture:* Silt loam  
*Drainage class:* Poorly drained  
*Dominant parent material:* Alluvium derived from mixed rocks

***Dominant Present Vegetation***

Paranat: Baltic rush, alkali sacaton, inland saltgrass  
Inclusion 1: Cattail  
Inclusion 2: Black greasewood, inland saltgrass, shadscale  
Inclusion 3: Willow

***Ecological Site***

Paranat: 028BY002NV  
Inclusion 1: 028BY044NV  
Inclusion 2: 028BY002NV  
Inclusion 3: 028BY081NV

# Prime Farmland

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## Prime Farmland and Other Important Farmland

In this section, prime farmland and other important farmland are defined. The map units in the survey area that are considered prime farmland are listed under "Prime Farmland Map Units" at the end of this section.

### Prime Farmland

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, seed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. An adequate moisture supply and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They either are used for food and fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures.

Prime farmland soils commonly receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable, and the level of acidity or alkalinity and the content of salts and sodium are acceptable. The soils have few if any rocks and are permeable to water and air. They are not excessively erodible or saturated

with water for long periods, and they are not frequently flooded during the growing season or are protected from flooding. Slopes range mainly from 0 to 6 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland where these limitations are overcome by drainage measures, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information about the criteria for prime farmland can be obtained at the local office of the Natural Resources Conservation Service.

A recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

About 43,115 acres, or nearly 2.8 percent of the survey area, would meet the requirements for prime farmland if an adequate and dependable supply of irrigation water were available.

The map units in the survey area that meet the requirements for prime farmland are listed under "Prime Farmland Map Units." On some soils included in the list, measures that overcome limitations are needed. The location of each map unit is shown on the detailed soil maps at the back of this publication. This list does not constitute a recommendation for a particular land use.

### Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high-quality crop when treated and managed by acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, and vegetables.

Unique farmland is used for a specific high-value food or fiber crop; has an adequate supply of available moisture for the specific crop because of stored moisture, precipitation, or irrigation; and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favor the production of a specific food or fiber crop.

Lists of unique farmland are developed as needed in cooperation with conservation districts and other entities. There are presently no soils recognized as unique farmland in Nevada.

### **Additional Farmland of Statewide Importance**

Some areas other than areas of prime and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate State agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable. In some states additional farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

Nevada has designated any farmland that is irrigated to be of statewide importance.

### **Prime Farmland Map Units**

The following map units meet the soil requirements for prime farmland if irrigated with a dependable water supply.

1530 Rebel sandy loam, 0 to 4 percent slopes  
1552 Sevenmile-Mosida-Rebel Association

The soils in Nye County, Nevada, Northwest part, typically have high salinity and sodicity which are restrictive to plant growth. Proper management to reduce the salinity and sodicity in the soil can alter the chemical properties of many soils so that they also will rate as prime farmland. The following map units may meet the soil requirements for prime farmland if reclaimed by reducing salinity and sodicity and they are irrigated:

1970 Linoyer-Rebel Association  
2220 Enko-Orovada Association  
2230 Rotinom-Wholan Association  
2340 Alley-Portmount-Rebel Association  
2342 Alley-Kelk Association

# Classification of the Soils

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The system of soil classification used by the National Cooperative Soil Survey has six categories (17). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 20, "Classification of the Soils," in Part II of this Publication shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

**ORDER.** Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

**SUBORDER.** Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Xeroll (*Xer*, meaning *xeric*, plus *oll*, from *Mollisol*).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Argixeroll. (*Argi*, meaning *presence of argillic horizon*, plus *xeroll*, the suborder of the *Mollisols* that have a *xeric* moisture regime).

**SUBGROUP.** Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Argixerolls.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature

regime, thickness of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is loamy-skeletal, mixed, frigid, Typic Argixerolls.

**SERIES.** The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

## Taxonomic Units and Their Morphology

In this section, each taxonomic unit recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each unit. A pedon, a small three-dimensional area of soil, that is typical of the unit in the survey area is described. The detailed description of each soil horizon follow standards in the "Soil Survey Manual"(16). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy"(17). Unless otherwise stated, colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the unit.

The map units of each taxonomic unit are described in the section "Detailed Soil Map Units".

## Advokay Series

The Advokay series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from coarse grained tuff, rhyolite, granite and related rocks. Advokay soils are on hills and pediments. Slopes are 2 to 15 percent. Mean annual precipitation is about 6 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Haplargids

**Typical pedon:** Advokay gravelly coarse sandy loam, in map unit 1229, rangeland. (Colors are for dry soil unless otherwise noted.) The surface pavement

consists of 50 percent pebbles mainly 2 to 20 millimeters.

A1--0 to 1 inch; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; many very fine and fine vesicular and interstitial pores; 30 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

A2--1 to 5 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine vesicular pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bt--5 to 9 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine through medium roots; many very fine tubular and interstitial pores; 30 percent pebbles; common moderately thick clay films lining pores; common thin lime and silica pendants on gravel; strongly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

Cr--9 inches; weathered, very highly fractured tuffaceous rock; few very fine roots in fractures.

**Type location:** 1,600 feet south and 2,200 feet west of the northeast corner of section 12, T. 12 N., R. 42 E. (38 degrees, 2 minutes, 41 seconds north latitude; 117 degrees, 12 minutes, 39 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring, and from 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to paralithic contact:* 4 to 14 inches.

*Reaction:* Mildly alkaline or moderately alkaline.

*Carbonates:* Calcareous in all parts, ranges from slightly effervescent to violently effervescent.

#### *Control section:*

Clay content--18 to 27 percent.

Rock fragments--15 to 35 percent, mostly 2 to 5 millimeters in diameter.

#### **A horizons:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

#### **Bt horizon:**

Value--5 or 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Clay content--20 to 35 percent.

Rock fragments--15 to 35 percent, mostly 2 to 5 millimeters in diameter. Subhorizons may range from 10 to 45 percent in some pedons.

Other features--Lime and silica pendants are common on pebbles in most pedons.

## Alley Series

The Alley series consists of very deep, well drained soils that formed in mixed alluvium with some influence from loess. Alley soils are on fan piedmont remnants. Slopes are 2 to 15 percent. The mean annual precipitation is about 8 inches and the mean annual air temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Alley gravelly sandy loam, in map unit 2252, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 20 percent pebbles.

A1--0 to 3 inches; pale brown (10YR 6/3) gravelly sandy loam, dark brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular and interstitial pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary.

A2--3 to 6 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist--moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots, common fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary.

Bt1--6 to 11 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common very fine and fine tubular pores; few thin clay film in pores; 15 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary.

Bt2--11 to 16 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine through medium roots; few fine tubular pores; common thin clay bridges between sand grains and common thin clay films in pores; 20 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

Bqk1--16 to 34 inches; light gray (10YR 7/2) gravelly sandy loam, brown (10YR 5/3) moist; many fine and medium distinct white (10YR 8/2) lime filaments; massive; very hard, firm, nonsticky and

nonplastic; many very fine and fine roots in pockets; few fine tubular pores; 20 percent pebbles; 5 percent cobbles; discontinuous strong silica and lime cementation; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.  
**Bqk2**--34 to 60 inches; very pale brown (10YR7/3) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderately thick platy structure parting to strong medium subangular blocky; hard, firm, nonsticky and nonplastic; many very fine and fine roots in pockets; 15 percent pebbles; discontinuous weak silica and lime cementation; lime seams and filaments; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** 200 feet north and 200 feet east of the southwest corner of section 11, T. 13 N., R. 47 E. (38 degrees, 58 minutes, 23 seconds north latitude; 116 degrees, 39 minutes, 24 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in the winter and spring months, dry spring and fall.

**Soil temperature:** 47 to 52 degrees F.

**Depth to weakly silica and lime cemented strata:** 16 to 30 inches.

**Depth to carbonates:** 16 to 22 inches.

Other features--Few to many, fine to coarse lime segregations are common in most pedons where depth to the Bqk horizon is greater than 22 inches.

#### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Reaction--Neutral or mildly alkaline.

Other features--When mixed, the surface 7 inches has color values greater than 5.5 dry and 3.5 moist.

#### Bt horizons:

Value--5 or 6 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Gravelly loam, gravelly clay loam or gravelly sandy clay loam.

Clay content--18 to 30 percent.

Rock fragments--15 to 25 percent, mainly pebbles.

Structure--Weak or moderate, fine to coarse subangular blocky.

Reaction--Mildly alkaline or moderately alkaline.

Consistence--Soft to hard, very friable or friable, slightly plastic and plastic.

#### Bqk horizons:

Value--6 through 8 dry, 4 through 6 moist.

Chroma--1 through 4.

Texture--Gravelly fine sandy loam, gravelly sandy loam, or cobbly fine sandy loam.

Rock fragments--15 to 35 percent, mainly pebbles or cobbles.

Consistence--Hard or very hard.

Reaction--Moderately alkaline or strongly alkaline.

Silica cementation--Few thin, or very thin discontinuous silica laminae are common in some pedons. Some pedons commonly have durinodes in a friable matrix below the weakly cemented horizons.

## Annaw Series

The Annaw series consists of very deep, well drained soils that formed in alluvium from mixed rock sources. Annaw soils are on fan piedmonts and fan skirts. Slopes are 2 to 15 percent. Mean annual precipitation is about 6 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Annaw very gravelly loamy sand, map unit 1323, rangeland. (Colors are for dry soil unless otherwise noted.) Approximately 40 percent surface pebbles and 1 to 2 percent cobbles.

**A**--0 to 2 inches; pale brown (10YR 6/3) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine and fine interstitial pores; 40 percent pebbles, 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**Bw**--2 to 11 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine and common fine interstitial pores; few faint traces of lime on lower surface of peds; 10 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.3); clear wavy boundary.

**Bk**--11 to 16 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine and common fine interstitial pores; finely divided lime throughout and on lower surface of peds and pebbles; 45 percent pebbles, violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

**2C**--16 to 44 inches; pale brown (10YR 6/3) finely stratified extremely gravelly loamy coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium roots; many very fine and fine and common medium and coarse interstitial pores;

common faint traces of lime on lower surfaces of peds; 65 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**3Btb--44 to 53 inches;** light yellowish brown (10YR 6/4) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and few fine tubular pores; few thin clay film lining pores; faint patches of lime on lower surface of peds; 15 percent pebbles; violently effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

**3Bk--53 to 60 inches;** very pale brown (10YR 7/4) finely stratified extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very very fine and fine roots; many very fine and common fine interstitial pores; many medium coatings of lime on pebble fragments; 65 percent pebbles; violently effervescent; moderately alkaline (pH 8.3).

**Type location:** 300 feet south and 700 feet west of the northeast one-fourth section 1, T. 10 N., R. 35 E. (38 degrees, 46 minutes, 5 seconds north latitude; 118 degrees, 1 minute, 22 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry; moist in some parts for short periods in winter and early spring months, and for 10 to 20 days cumulative between July to October following convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Reaction:** Moderately alkaline or strongly alkaline.

**Carbonates:** Calcareous in all parts, ranges from slightly effervescent to violently effervescent.

**Control section:**

Rock fragments--Averages 35 to 60 percent mostly pebbles.

Other features--Buried B horizon below 40 inches is absent in most pedons.

#### A horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

#### Bw horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture (less than 2 millimeter fraction)--Sandy loam, fine sandy loam.

Rock fragments--10 to 40 percent pebbles, 0 to 10 percent cobbles.

Clay films--Few thin films in pores at the top of the horizon in some pedons.

#### Bk horizon:

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Sandy loam or loamy sand.

Structure--Massive or subangular blocky.

#### 2C and 3Bk horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture (less than 2 millimeters fraction)--Loamy sand, sand, loamy fine sand, loamy coarse sand.

Some pedons have thin strata of sandy loam.

Structure--Massive or weak subangular blocky.

Rock fragments--35 to 65 percent pebbles, 0 to 15 percent cobbles.

Consistence--Soft or slightly hard, dry, nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Other features--Horizons are stratified. Strata of gravelly material are included in some pedons.

Lime occurs as pendants on pebbles and is disseminated in most pedons.

Lime coated pebbles are in some horizons in some pedons.

## Armespan Series

The Armespan series consists of very deep, well drained soils that formed in alluvium derived from mixed rock sources. Armespan soils are on fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Durixerollic Calciorthids

**Typical pedon:** Armespan very gravelly sandy loam, in map unit 1648 rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 50 percent pebbles.

**A1--0 to 1 inch;** pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few very fine interstitial and common very fine vesicular pores; 35 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

**A2--1 to 5 inches;** pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine interstitial and common very fine vesicular pores; 10 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

**Bw--5 to 9 inches;** pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and medium roots; common fine tubular

pores; 20 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

**Bk**--9 to 22 inches; light gray (10YR 7/2) gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine through medium roots; common fine tubular pores; 30 percent pebbles; soft powdery lime throughout horizon; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

**Bqk**--22 to 44 inches; light gray (10YR 7/2) very gravelly sandy loam, pale brown (10YR 6/3) moist; massive; soft to very hard, very friable to firm, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; 45 percent pebbles and 5 percent cobbles; 30 percent strong discontinuous silica cemented brittle masses and 25 percent lime cemented plates and pendants on undersides of rock fragments; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

**C**--44 to 60 inches; light gray (10YR 7/2) very gravelly loamy coarse sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 45 percent pebbles; lime coats on rock fragment undersides; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** 1,600 feet west and 1,200 feet south of the northeast corner of section 20, T. 8 N., R. 38 E. (38 degrees, 32 minutes, 42 seconds north latitude; 117 degrees, 43 minutes, 27 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in winter and spring, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Reaction:** Moderately alkaline or strongly alkaline.

**Carbonates:** Strongly effervescent or violently effervescent throughout.

**Depth to Bk horizon:** 4 to 10 inches.

**Thickness of calcic horizon:** 15 to 35 inches.

**Control section:**

Clay content--10 to 18 percent.

Rock fragments--Averages 35 to 60 percent.

#### A horizons:

Value--6 or 7 dry, 4 through 6 moist.

Chroma--2 or 3.

#### Bw horizon:

Value--6 or 7 dry, 4 through 6 moist.

Chroma--2 or 3.

Texture of the fine earth--Sandy loam or loam.

Rock fragments--15 to 35 percent, dominantly pebbles.

Consistence--Soft or slightly hard dry, nonsticky or slightly sticky, nonplastic or slightly plastic wet.

#### Bk horizon:

Value--6 through 8 dry, 5 through 7 moist.

Chroma--2 through 4 dry or moist.

Texture of the fine earth--Sandy loam or loam.

Consistence--Soft or slightly hard dry, very friable or friable moist, nonsticky or slightly sticky and nonplastic or slightly plastic.

Clay content--12 to 18 percent.

Rock fragments--15 to 35 percent, dominantly pebbles.

Structure--Massive, weak to moderate platy or subangular blocky.

Consistence--Nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Carbonates--Soft powdery lime throughout horizon. Some pedons have few to many 2 millimeter lime coats and pendants on underside of pebbles.

Calcium carbonate equivalent--10 to 35 percent.

#### Bqk horizon:

Value--6 through 8 dry, 5 through 7 moist.

Chroma--2 or 3 dry or moist.

Texture of the fine earth--Sandy loam, coarse sandy loam.

Clay content--10 to 18 percent.

Rock fragments--35 to 60 percent, predominantly pebbles.

Carbonates--Calcium carbonate equivalent (less than 20 millimeter fraction) 10 to 35 percent.

Consistence--Loose to hard, dry; loose to friable, moist; nonsticky to slightly sticky and nonplastic to slightly plastic wet.

Other features--20 to 50 percent weak to strong discontinuous silica-lime cementation as plates and pendants on undersides of rock fragments. Some pedons have few fine soft masses of lime.

#### C horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3 dry or moist.

Texture of the fine earth--Loamy sand, loamy coarse sand.

Clay content--5 to 10 percent.

Rock fragments--35 to 60 percent, predominantly pebbles.

Structure--Massive or single grained.

Carbonates--Lime pendants on undersides of rock fragments.

Consistence--Loose to hard, dry; loose to friable, moist.

## Armoine Series

The Armoine series consists of shallow, well drained soils that formed in residuum and colluvium from granitic rock. Armoine soils are on hills, and rock pediments. Slopes are 4 to 50 percent. Mean annual precipitation is about 10 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Armoine very gravelly sandy loam, in map unit 2180, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 40 percent pebbles.

A1--0 to 2 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; few fine vesicular pores; 40 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

A2--2 to 5 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common fine tubular pores; 25 percent pebbles and 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bt--5 to 11 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; 40 percent pebbles; few thin clay films on faces of peds and lining pores; slightly effervescent in the lower part; moderately alkaline (pH 8.2); clear smooth boundary.

Bk--11 to 15 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; 45 percent pebbles; few thin lime coating underside of rock fragments, violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr--15 inches; highly weathered granitic bedrock.

**Type location:** 2,400 feet south and 2,000 feet east of the northwest corner of section 1, T. 8 N., R. 37 E. (38 degrees, 34 minutes, 55 seconds north latitude; 117 degrees, 48 minutes, 39 seconds west longitude.)

### Range in characteristics:

**Soil moisture:** Moist in winter and spring, mostly dry in summer and fall, except for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to paralithic contact:** 14 to 20 inches.

**Control section:**

Clay content--18 to 25 percent.

Rock fragments--35 to 55 percent with 5 percent cobbles and stones, more than 50 percent of pebble sized fragments are 2 to 5 millimeters.

### A horizons:

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 or 3.

Reaction--Mildly alkaline or moderately alkaline.

Carbonates--Noneffervescent or strongly effervescent.

### Bt horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Sandy clay loam, sandy loam.

Rock fragments--35 to 55 percent, mostly pebbles.

Consistence--Soft or slightly hard dry, slightly sticky or sticky, nonplastic or slightly plastic wet.

Reaction--Mildly alkaline or strongly alkaline.

Carbonates--Commonly noneffervescent, slightly effervescent in lower part of some pedons.

### Bk horizon:

Reaction--Moderately alkaline or strongly alkaline.

Structure--Massive or subangular blocky.

Consistence--Soft or slightly hard, very friable or friable. Carbonates--Strongly effervescent or violently effervescent.

## Barnmot Series

The Barnmot series consist of very deep, well drained soils that formed in residuum and colluvium weathered from semi-consolidated lake sediments. Barnmot soils are on hills. Slopes are 15 to 50 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 52 degrees F.

**Taxonomic class:** Fine, montmorillonitic (calcareous), mesic Typic Torriorthents

**Typical pedon:** Barnmot gravelly clay loam, in map unit 1466, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 5 percent cobbles, and 30 percent pebbles.

A--0 to 5 inches; pale brown (10YR 6/3) gravelly clay loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, sticky and plastic; many

very fine through medium roots; common very fine interstitial and few very fine vesicular pores; 25 percent pebbles, 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. .

C1--5 to 15 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine through coarse roots; many very fine interstitial and few very fine tubular pores; 5 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

C2--15 to 23 inches; pink (7.5YR 7/4) clay loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine through coarse roots; few very fine tubular pores; 5 percent pebbles and 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

C3--23 to 41 inches; pink (7.5YR 7/4) clay loam, brown (7.5YR 5/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine through coarse roots; few very fine tubular pores; 5 percent pebbles and 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

C4--41 to 60 inches; light gray (10YR 7/2) clay, brown (10YR 5/3) moist; massive; hard, firm, very sticky and plastic; few root mats in cracks; few very fine and fine interstitial pores; 5 percent pebbles and 5 percent cobbles; moderately alkaline (pH 8.4).

**Type location:** 2,000 feet east and 2,000 feet south of the northwest corner of section 31, T. 11 N., R. 38 E. (38 degrees, 45 minutes, 35 seconds north latitude; 117 degrees, 44 minutes, 58 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry in summer and autumn, and moist for short periods during spring and winter.

*Soil temperature:* 53 to 55 degrees F.

#### Control section:

Clay content--35 to 55 percent.

Rock fragments--Less than 15 percent.

#### A horizon:

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 or 3.

#### C horizons:

Hue--7.5YR, 10YR or 2.5Y.

Value--5 through 8 dry, 4 through 6 moist.

Chroma--2 through 4 moist and dry.

Texture--Clay or clay loam.

Clay content--35 to 55 percent clay.

Reaction--Moderately alkaline or strongly alkaline.  
Structure--Prismatic, subangular blocky or massive.  
Consistence--Slightly hard to very hard, very friable to firm, sticky to very sticky.

## Beelem Series

The Beelem series consists of very shallow, well drained soils that formed in residuum and colluvium from welded tuffs and altered granite. Beelem soils are on hills, mesas, plateaus, and pediments. Slopes are 15 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic Lithic Xeric Torriorthents

**Typical pedon:** Beelem cobbly sandy loam, in map unit 1220, woodland. (Colors are for dry soil unless otherwise noted.) The surface is covered by approximately 15 percent cobbles and 45 percent pebbles.

A1--0 to 3 inches; pale brown (10YR 6/3) cobbly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine interstitial pores; 15 percent pebbles and 15 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

A2--3 to 6 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

R--6 inches; tuff; weathered in the upper 4 inches with lime coats in fractures; becomes hard at 10 inches.

**Type location:** 100 feet west and 50 feet south of the northeast corner of section 28, T. 7 N., R. 43 E. (38 degrees, 26 minutes, 30 seconds north latitude; 117 degrees, 9 minutes, 0 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring, dry in summer and fall, except moist for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to bedrock:* 4 to 9 inches.

*Reaction:* Mildly alkaline or moderately alkaline.

*Effervescence:* Slightly effervescent to violently effervescent throughout.

**Control section:**

Clay content--10 to 18 percent.  
 Rock fragments--15 to 35 percent, predominantly 2 to 5 millimeter pebbles.

**A horizons:**

Hue--10YR or 2.5Y.  
 Value--6 or 7 dry, 4 or 5 moist.  
 Chroma--2 through 4 dry or moist. Color variations are due to lithochromic influence.

**Bellehelen Series**

The Bellehelen series consists of shallow or very shallow well drained soils that formed in residuum and colluvium from volcanic rocks. Bellehelen soils are on hills and mountain slopes. Slopes are 15 to 75 percent. The mean annual precipitation is about 12 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Argixerolls

**Typical pedon:** Bellehelen very stony loam, in map unit 1420, woodland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 35 percent pebbles, 25 percent cobbles and 5 percent stones.

A--0 to 5 inches; brown (10YR 5/3) very stony loam, dark brown (10YR 3/3) moist; weak medium platy structure parting to moderate medium subangular blocky; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common fine vesicular pores; 30 percent pebbles, 25 percent cobbles, 3 percent stones; neutral (pH 7.2); clear smooth boundary.

Bt--5 to 11 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; many fine to medium roots; common fine tubular pores; common thin clay films on faces of peds, lining pores and coating rock fragments; 45 percent pebbles, 10 percent stones, neutral (pH 7.3); clear wavy boundary.

R--11 inches; hard andesitic tuff, weathered in the upper 4 inches.

**Type location:** Nye County, Nevada; Kawich Range, Stone Cabin Valley, approximately 2,200 feet north and 1,100 feet west of the southeast corner of section 24, T. 1 N., R. 48 E. (37 degrees, 54 minutes, and 36 seconds north latitude; 116 degrees, 30 minutes, and 39 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in winter and spring, dry summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 47 to 53 degrees F.

**Depth to bedrock:** 7 to 14 inches.

**Reaction:** Neutral to mildly alkaline.

**Control section:**

Clay content--Averages 18 to 35 percent.  
 Rock fragments--35 to 60 percent.

**A horizon:**

Value--4 or 5 dry, 2 or 3 moist.  
 Chroma--2 or 3.

**Bt horizon:**

Value--5 or 6 dry, 3 or 4 moist.  
 Chroma--3 or 4.

Texture (less than 2 mm)--Loam, sandy clay loam, or clay loam, and may include subhorizons with greater than 35 percent clay.

**Berzatic Series**

The Berzatic series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from shale, limestone, dolomite and related sedimentary rocks. They are on hills with slopes ranging from 8 to 75 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents

**Typical pedon:** Berzatic extremely cobbly fine sandy loam, in map unit 1262, rangeland. (Colors are for air-dry soil unless otherwise noted.) The surface is covered with 45 percent surface pebbles and 35 percent cobbles.

A--0 to 2 inches; pale brown (10YR 6/3) extremely cobbly fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky, nonplastic; few very fine and fine roots; many very fine vesicular and common very fine tubular pores; 45 percent pebbles, 25 percent cobbles; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

Bw--2 to 6 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; soft; very friable, nonsticky, nonplastic; common very fine and fine roots; common very fine interstitial and few very fine tubular pores; 40 percent pebbles, 5 percent cobbles; few faint patches of lime on lower

faces of peds; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Bk--6 to 11 inches; pale brown (10YR 6/3) extremely cobbly fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky, nonplastic; common very fine and fine and few medium roots; common very fine interstitial and few very fine tubular pores; 30 percent pebbles, 60 percent cobbles; many distinct coatings of lime on pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

R--11 inches; hard fractured dolomite; lime coating rock surface, moderately thick.

**Type location:** 600 feet east and 1,400 feet south of the northwest corner of section 7, T.12 N., R. 37 E. (38 degrees, 55 minutes, and 13 seconds north latitude; 117 degrees, 52 minutes, and 3 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, but moist in the winter and spring and in some parts for short periods for 10 to 20 days from July to September following convection storms.

*Soil temperature:* 51 to 55 degrees F.

*Depth to bedrock:* 8 to 20 inches.

*Reaction:* Moderately alkaline to strongly alkaline.

Calcium carbonate equivalent--15 to 35 percent of the 20 millimeter fraction

*Control section:*

Clay content--8 to 18 percent.

Rock fragments--Averages 35 to 80 percent dominated by gravel and channery fragments. May be dominated by cobbles in some pedons.

**A horizon:**

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 or 3.

**Bw and Bk horizons:**

Hue--10YR, 2.5Y or 7.5YR.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture (2 mm fraction)--Fine sandy loam, sandy loam or light loam. 45 to 75 percent, dominantly cobbles but is dominated by gravel in some pedons. Some pedons include a high percent of flat, elongated shale fragments, but are always dominated by sub-rounded or angular fragments.

Structure--Subangular blocky or is massive.

Calcium carbonate--Lime is disseminated throughout the Bk horizon and is present as thin coatings and thin to moderately thick pendants on rock fragments.

## Blacktop Series

The Blacktop series consists of very shallow, somewhat excessively drained soils that formed in residuum and colluvium from volcanic rocks. Blacktop soils are on hills, mesas and pediments. Slopes are 8 to 75 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents.

**Typical pedon:** Blacktop very stony fine sandy loam, in map unit 1835, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 3 percent stones, 20 percent cobbles and 40 percent pebbles.

A1--0 to 2 inches; very pale brown (10YR 7/3) very stony fine sandy loam, brown (10YR 5/3) moist; weak moderately thick platy structure parting to weak fine and medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common fine vesicular pores; 30 percent pebbles, 20 percent cobbles and 3 percent stones; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2--2 to 6 inches; very pale brown (10YR 7/3) very cobbly fine sandy loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly plastic and slightly sticky; few very fine and fine roots; few fine tubular pores; 30 percent pebbles, 20 percent cobbles and 3 percent stones; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

R--6 inches; hard rhyolitic tuff rock with roots and soils in some fractures.

**Type location:** 1,800 feet south of the northeast corner of section 16, T. 11 N., R. 36 E. (38 degrees, 49 minutes, and 9 seconds north latitude; 117 degrees, 55 minutes, 33 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in some parts for short periods during winter and early spring and for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to bedrock:* 4 to 10 inches.

*Carbonates:* Slightly effervescent to strongly effervescent.

*Reaction:* Mildly alkaline or moderately alkaline.

**Control section:**

Clay content--10 to 18 percent.  
 Texture of fine earth--Sandy loam or fine sandy loam.  
 Rock fragments--35 to 70 percent.

(38 degrees, 31 minutes, 4 seconds north latitude;  
 117 degrees, 38 minutes, 27 seconds west longitude.)

**A horizon:**

Chroma--2 or 3.

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during winter and spring months, and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to paralithic contact:** 6 to 14 inches.

**Carbonates:** Noneffervescent or slightly effervescent.

**Control section:**

Clay content--18 to 27 percent.

Rock fragments--35 to 55 percent, more than 50 percent of the pebble-sized fragments are 2 to 5 millimeters.

Sand fraction--Dominated by coarse and very coarse sand.

**Blappert Series**

The Blappert series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from granitic rock. Blappert soils are on mountain slopes and hills. Slopes are 15 to 50 percent. Mean annual precipitation is about 7 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Haplargids

**Typical pedon:** Blappert very gravelly sandy loam, in map unit 2100, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 40 percent pebbles and 10 percent cobbles.

**A horizon:**

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 or 3.

Reaction--Moderately alkaline or strongly alkaline.

**Bt horizons:**

Value--5 or 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Texture--Sandy clay loam or coarse sandy loam.

Rock fragments--35 to 60 percent.

Consistence--Soft or slightly hard dry, very friable or friable, slightly sticky or sticky and slightly plastic or plastic.

Reaction--Mildly alkaline or moderately alkaline.

A--0 to 3 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak moderately thick platy structure parting to moderate medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular and common fine and very fine interstitial pores; 40 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); slightly effervescent; clear smooth boundary.

Bt1--3 to 7 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular and few fine interstitial pores; common thin clay films on faces of peds and in pores; 35 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.2); clear wavy boundary.

Bt2--7 to 9 inches; light yellowish brown (10YR 6/4) very gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few medium and fine and very fine roots; common fine tubular and few fine interstitial pores; few thin clay films on faces of peds and in pores; 45 percent pebbles; 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear irregular boundary.

Cr--9 inches; decomposed and highly fractured granitic bedrock.

**Bluewing Series**

The Bluewing series consists of very deep, excessively drained soils that formed in very gravelly, sandy alluvium derived from mixed rock sources. Bluewing soils are on channels. Slopes are 2 to 4 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Bluewing very gravelly loamy sand, in map unit 2110, rangeland. (Colors are for dry soils unless otherwise noted.) The surface is covered with 45 percent pebbles and 5 percent cobbles.

A--0 to 3 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; moderate medium and coarse platy structure; soft, very friable, nonsticky, nonplastic; common very fine roots; many very fine and fine interstitial pores; 35 percent pebbles; 1 percent cobbles; slightly

**Type location:** 1,000 feet west and 600 feet south of the north east corner of section 31 T. 8 N., R. 39 E.

effervescent; strongly alkaline (pH 8.5); abrupt wavy boundary.

Bk1--3 to 9 inches; pale brown (10YR 6/3) gravelly coarse sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; many very fine and fine interstitial pores; 30 percent pebbles; few thin lime pendants on lower surface of peds or pebbles; slightly effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

Bk2--9 to 39 inches; pale brown (10YR 6/3) stratified very gravelly sand to extremely gravelly loamy coarse sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; many very fine and fine, common medium interstitial pores; 50 percent pebbles; 5 percent cobbles; common thin lime pendants on lower surface of peds or pebbles; slightly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary.

Bk3--39 to 60 inches; pale brown (10YR 6/3) very gravelly loamy coarse sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 50 percent pebbles; many moderately thick lime pendants on lower surface of peds and pebbles and few faint lime films on sand and pebbles; strongly alkaline (pH 9.0).

**Type location:** 400 feet north and 2,100 feet west of the southeast corner of section 30, T. 13 N., R. 34 E. (38 degrees, 57 minutes, 34 seconds north latitude; 118 degrees, 11 minutes, 21 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, intermittently moist in winter and early spring, dry from early May through October.

*Soil temperature:* 53 to 59 degrees F.

*Reaction:* Mildly alkaline to strongly alkaline.

*Carbonate:* Noneffervescent to violently effervescent.

*Control section:*

Clay content--Averages 3 to 8 percent.

#### A horizon:

Hue--10YR or 2.5Y

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

#### Bk horizons:

Hue--10YR or 2.5Y.

Value--5 through 8 dry; 3 through 5 moist.

Chroma--2 through 4.

Texture--Dominantly loamy coarse sand or coarse sand but may include strata ranging from loamy sand to loam.

Rock fragments--Averages 50 to 80 percent, mainly pebbles with up to 25 percent cobbles and stones; the pebbles are dominantly 3/4 to 1 1/4 inch in diameter.

Structure--Horizon is massive or single grained.

Consistence--Soft or slightly hard.

## Budihol Series

The Budihol series consists of very shallow and shallow, well drained soils formed in granitic residuum and colluvium. These soils are on mountains. Slopes are 30 to 75 percent. Mean annual precipitation is about 9 inches and mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy, mixed, nonacid, mesic, shallow Xeric Torriorthents.

**Typical pedon:** Budihol extremely bouldery sandy loam, in map unit 1681, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 40 percent pebbles, 15 percent stones, and 20 percent boulders.

A1--0 to 2 inches; pale brown (10YR 6/3) extremely bouldery sandy loam, brown (10YR 4/3) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial pores; 30 percent pebbles, 10 percent stones 20 percent boulders; neutral (pH 7.2); abrupt smooth boundary.

A2--2 to 14 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 25 percent pebbles, 2 percent cobbles; neutral (pH 7.3) abrupt wavy boundary.

Cr--14 to 22 inches; weathered granodiorite; common fine roots in fractures.

R--22 inches--hard granodiorite.

**Type location:** 1,000 feet west and 1,400 feet south of the northeast corner of section 19, T. 13 N., R. 36 E. (38 degrees, 58 minutes, 44 seconds north latitude; 117 degrees, 53 minutes, 2 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring, dry in summer and fall.

*Soil temperature:* 47 to 53 degrees F.

*Depth to weathered bedrock:* 6 to 14 inches.

*Depth to unweathered bedrock:* 20 to 30 inches.

*Control section:*

Texture--Sandy loam or coarse sandy loam.

Clay content--12 to 18 percent.  
Rock fragments--15 to 35 percent. (Mostly fine pebbles)

**A horizons:**

Value--5 or 6 dry, 3 or 4 moist.  
Chroma--2 or 3.

## Buffaran Series

The Buffaran series consists of shallow to a duripan, well drained soils that formed in alluvium derived from mixed rock sources. Buffaran soils are on fan piedmonts. Slopes are 2 to 15 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 46 degrees F.

**Taxonomic class:** Clayey, montmorillonitic, mesic, shallow Xerollic Durargids

**Typical pedon:** Buffaran gravelly loam, in map unit 2344, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent pebbles.

A--0 to 4 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; 15 percent pebbles; neutral (pH 7.8); clear smooth boundary.

Bt1--4 to 7 inches; light brown (7.5YR 6/4) gravelly clay loam, brown (7.5YR 5/4) moist; moderate fine granular structure; slightly hard, friable, sticky and slightly plastic; common medium to coarse roots; many fine and medium interstitial pores; common moderately thick clay films bridging sand grains; 15 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

Bt2--7 to 13 inches; pale brown (10YR 6/3) gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and few fine roots; common very fine tubular pores; common moderately thick clay films on peds and bridging sand grains; 15 percent pebbles; moderately alkaline (pH 8.2) clear smooth boundary.

Bq--13 to 15 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; 30 percent pebbles and 1 to 4 centimeter pieces of strongly silica-cemented duripan fragments; moderately alkaline (pH 8.2); strongly effervescent; abrupt wavy boundary.

Bqkm--15 to 29 inches; indurated silica and lime cemented duripan; massive; extremely hard,

extremely firm; alternate strong cementation and indurated silica laminae.

Bqm--29 to 60 inches; light gray (10YR 7/2) strongly silica cemented duripan consisting of many thin laminae with weakly cemented material between the laminae; violently effervescent;

**Type location:** 700 feet west and 2,400 feet north of the southeast corner of section 9, T. 13 N., R. 40 E. (39 degrees, 0 minutes, 19 seconds north latitude; 117 degrees, 28 minutes, 38 seconds west longitude.)

### Range in characteristics:

*Soil moisture:* Usually dry; moist in winter and spring, dry early June through October.

*Soil temperature:* 47 to 52 degrees F.

*Depth to duripan:* 14 to 20 inches.

**A horizon:**

Hue--10YR or 7.5YR

Value--5 or 6 dry, 3 or 4 moist, (after mixing 7 inches value greater than 5.5 dry)

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

**Bt horizons:**

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 4 or 6.

Texture--Clay or clay loam (35 to 50 percent clay).

Structure--Subangular blocky or granular.

Consistence--Slightly hard or hard dry, very friable or friable moist, slightly plastic or plastic wet.

Rock fragments--5 to 40 percent, mostly pebbles.

Reaction--Neutral to moderately alkaline.

**Bq horizon:**

Texture--Loam or clay loam.

Consistence--Slightly hard or hard dry, very friable or friable moist, slightly sticky to sticky and slightly plastic to plastic, wet.

Rock fragments--20 to 40 percent strongly cemented duripan fragments.

Reaction--Neutral to moderately alkaline

Effervescence--Noneffervescent to strongly effervescent.

## Celeton Series

The Celeton series consists of very shallow and shallow, somewhat excessively drained soils that formed in residuum from diatomaceous earth. Celeton soils are hills and pediments. Slopes are 4 to 50 percent. Mean annual precipitation is about 5 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents

**Typical pedon:** Celeton very gravelly loam, in map unit 1061, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 50 percent pebbles and 5 percent cobbles.

A--0 to 2 inches; light brownish gray (10YR 6/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common fine vesicular pores; 25 percent soft diatomaceous earth fragments; 45 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

C--2 to 9 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and slightly plastic; common fine roots; many very fine interstitial pores; 80 percent soft diatomaceous earth fragments, 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); abrupt irregular boundary.

Cd--9 to 20 inches; soft diatomaceous earth and other soft sedimentary rocks with few fine roots in fractures.

**Type location:** 2,600 feet north and 100 feet east of the southwest corner of section 5, T. 12 N., R. 35 E. (38 degrees, 51 minutes, 31 seconds north latitude; 118 degrees, 10 minutes, 36 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring months.

*Soil temperature:* 53 to 57 degrees F.

*Depth to paralithic contact:* 4 to 14 inches.

*Carbonates:* Slightly effervescent or strongly effervescent.

*Reaction:* Mildly alkaline to strongly alkaline.

*Control section:*

Percent clay--5 to 15 percent.

Rock fragments--5 to 25 percent (hard) 60 to 80 percent (soft) diatomaceous earth.

#### A horizon:

Value--6 through 8 dry, 4 through 7 moist.

Chroma--2 or 3.

#### C horizon:

Value--6 through 8 dry.

Chroma--0 through 3.

Texture--Sandy loam or loam with 5 to 20 percent rock fragments.

Structure--Massive or subangular blocky.

Consistence--Soft to hard, very friable to firm, nonplastic to plastic.

Other features--80 to 90 percent fragments of diatomaceous earth that are 60 to 80 percent soft and 5 to 20 percent hard.

## Chill Series

The Chill series consists of very shallow and shallow, well drained soils formed in residuum from granitic bedrock. Chill soils are on hills and pediments. Slopes are 4 to 15 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Haplargids

**Typical pedon:** Chill gravelly sandy loam, in map unit 1351 rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 30 percent pebbles.

A--0 to 2 inches; pale brown (10YR 6/3) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine vesicular pores; 30 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary.

Bt--2 to 6 inches; dark yellowish brown (10YR 4/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, sticky and plastic; common very fine, fine and medium roots; few very fine and fine tubular and common very fine interstitial pores; 20 percent pebbles; common thin clay films in pores; mildly alkaline (pH 7.7); clear wavy boundary.

Cr--6 inches; strongly weathered granodiorite grus; few fine and common medium roots in fractures; common thin clay coats on individual fragments in the upper part; abrupt wavy boundary.

**Type location:** 100 feet west and 1,800 feet south of the northeast corner of section 1, T. 8 N., R. 37 E. (38 degrees, 34 minutes, 56 seconds north latitude; 117 degrees, 48 minutes, 6 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring, dry June through November.

*Soil temperature:* 50 to 56 degrees F.

*Depth to paralithic contact:* 6 to 14 inches.

*Control section:*

Clay content--18 to 27 percent.

Sand content--45 to 65 percent.

Rock fragments--15 to 35 percent, mainly fine pebbles.

Reaction--Neutral or mildly alkaline.

**A horizon:**

Value--5 or 6 dry, 3 or 4 moist.  
Chroma--2 or 3.

**Bt horizon:**

Hue--10YR or 7.5YR.  
Value--4 through 6 dry, 3 through 5 moist.  
Chroma--3 or 4.  
Clay content--25 to 35 percent.  
Consistence--Soft to hard, very friable to firm, slightly sticky or sticky, and slightly plastic or plastic.

## Chuckridge Series

The Chuckridge series consists of shallow and very shallow over a duripan, well drained soils that formed in mixed alluvium. They are on fan piedmonts. Slopes are 2 to 8 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Chuckridge gravelly sandy loam, in map unit 1483, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent pebbles and 5 percent cobbles.

A--0 to 6 inches; pale brown (10YR 6/3) gravelly sandy loam, dark brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, slightly sticky, nonplastic; few fine roots; many very fine and fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary.

Bt--6 to 11 inches; light yellowish brown (10YR 6/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, sticky, and plastic; many fine and medium roots; common fine tubular pores; 25 percent pebbles; common moderately thick clay films lining pores and on faces of peds, strongly effervescent; mildly alkaline (pH 7.4); abrupt wavy boundary.

Bqkm1--11 to 17 inches; indurated duripan with continuous laminar cap.

Bqkm2--17 to 60 inches; continuous strongly cemented hardpan with discontinuous laminar coating and bridging.

**Type location:** 2,200 feet north and 2,300 feet east of the southwest corner of section 25, T. 1 N., R. 48 E. (37 degrees, 54 minutes, 21 seconds north latitude; 116 degrees, 33 minutes, 18 seconds west longitude.)

### Range in characteristics:

**Soil moisture:** Moist in winter and spring, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to duripan:** 7 to 14 inches.

**Carbonates:** Noneffervescent or slightly effervescent in the upper part, strongly effervescent or violently effervescent in the lower part.

**Control section:**

Clay content--22 to 32 percent.

Rock fragments--15 to 35 percent dominantly pebbles.

**A horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Reaction--Mildly alkaline or moderately alkaline.

**Bt horizons:**

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Gravelly loam, gravelly clay loam, or gravelly sandy clay loam.

Clay content--25 to 35 percent.

Rock fragments--15 to 35 percent, predominantly pebbles.

Structure--Strong or moderate subangular blocky structure.

Consistence--Slightly hard or hard dry, slightly sticky or sticky and slightly plastic or plastic wet.

Reaction--Mildly alkaline to strongly alkaline.

**Bqkm horizon:**

Value--7 or 8 dry, 5 through 7 moist.

Chroma--2 or 3.

Rock fragments--35 to 60 percent, predominantly pebbles, with 10 to 30 percent cobbles in some pedons.

Cementation--Indurated duripan with 1/16 to 1/8 inch silica laminae. The lower portion of the duripan is strongly cemented with discontinuous silica laminae coating and bridging rock fragments.

## Cirac Series

The Cirac series consists of very deep, well drained soils that formed in mixed alluvium. Cirac soils are on alluvial flats. Slopes are 0 to 4 percent. Mean annual precipitation is about 6 inches and mean annual air temperature is about 54 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Typic Torrifluvents

**Typical pedon:** Cirac fine sandy loam, in map unit 1495, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with less than 5 percent pebbles.

- A1--0 to 1 inch; light gray (10YR 7/2) fine sandy loam, brown (10YR 5/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine vesicular pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.
- A2--1 to 4 inches; light gray (10YR 7/2) sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common fine interstitial pores; many fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.
- C1--4 to 11 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary.
- C2--11 to 17 inches; pale brown (10YR 6/3) finely stratified fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary.
- C3--17 to 30 inches; pale brown (10YR 6/3) finely stratified sand to silt loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary.
- C4--30 to 60 inches; pale brown (10YR 6/3) finely stratified fine sandy loam, brown (10YR 4/3) moist with faint relict mottles; massive; soft, very friable, slightly sticky and slightly plastic; slightly effervescent; strongly alkaline (pH 8.6).

**Type location:** 100 feet east and 500 feet south of the northwest corner of section 17, T. 11 N., R. 36 E. (38 degrees, 49 minutes, 20 seconds north latitude; 117 degrees, 57 minutes, 44 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Reaction:** Strongly alkaline or very strongly alkaline.

**Effervescence:** Slightly effervescent to violently effervescent throughout.

**Salinity:** 16 to 30 mmhos.

**Sodium absorption ratio:** 13 to 90.

**Organic matter:** Irregular decrease with depth.

**Control section:**

Rock fragments--Average 0 to 15 percent, dominantly 2 to 4.6 millimeter pebbles, with any layer in substrata containing up to 35 percent. Clay content--Averages 8 to 18 percent.

#### A horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

#### C horizons:

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Averages sandy loam or loam, includes layers of gravelly sandy to silt loam.

Structure--Prismatic, subangular blocky, platy or is massive

Consistence--Soft to hard dry, very friable or friable moist, or is loose, nonsticky or sticky and nonplastic or plastic wet.

Rock fragments--0 to 15 percent average, with any strata containing up to 35 percent.

## Clanalpine Series

The Clanalpine series consists of moderately deep, well drained soils that formed in residuum and colluvium from monzonite, rhyolitic and andesitic tuff. Clanalpine soils are on mountain side slopes. Slopes are 30 to 50 percent. Mean annual precipitation is about 15 inches and the mean annual temperature is about 41 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Typic Argixerolls

**Typical pedon:** Clanalpine very gravelly loam, in map unit 1162, woodland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 40 percent pebbles and 5 percent cobbles.

O--1 inch to 0; pine needles and litter.

A1--0 to 2 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular and interstitial pores; 35 percent pebbles, 5 percent cobbles; neutral (pH 7.2); clear smooth boundary.

A2--2 to 9 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; common very fine, fine, and medium tubular pores; 45 percent

pebbles, 10 percent cobbles; neutral (pH 7.2); clear smooth boundary.

Bt1--9 to 14 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; common very fine, fine, and medium tubular pores; common thin clay films lining pores, on face of peds, and coating rock fragments; 30 percent pebbles, 25 percent cobbles; neutral (pH 7.2); clear smooth boundary.

Bt2--14 to 26 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine, fine, and medium roots; few fine tubular pores; common thin clay films lining pores, on faces of peds, and coating rock fragments; 25 percent pebbles, 30 percent cobbles; neutral (pH 7.2); clear smooth boundary.

Bt3--26 to 34 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; strong fine subangular blocky structure; slightly hard, very friable, sticky and plastic; few medium roots; few fine tubular pores; common thin clay films lining pores, on faces of peds, and coating rock fragments; 15 percent pebbles, 40 percent cobbles; neutral (pH 7.2); clear wavy boundary.

Cr--34 inches; weathered and highly fractured rhyolitic tuff with clay coating fractures and roots in pockets.

**Type location:** 2,000 feet south and 1,600 feet east of the northwest corner of section 24, T. 14 N., R. 37 E. (39 degrees, 4 minutes, 2 minutes north latitude; 117 degrees, 46 minutes, 17 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually moist from late fall through early summer, dry mid summer through mid fall.

*Soil temperature:* 43 to 45 degrees F.

*Mollic epipedon thickness:* 8 to 14 inches, includes the Bt1 horizon in some pedons.

*Solum thickness:* 20 to 40 inches.

*Depth to argillic horizon:* 5 to 15 inches.

*Depth to weathered bedrock (paralithic):* 20 to 40 inches.

*Depth to bedrock:* 40 to 60 inches.

*Other features:* Some pedons have BC horizons overlying the paralithic contact.

*Control section:*

Clay content--25 to 35 percent.

Rock fragments--35 to 60 percent, mainly pebbles and cobbles.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

#### Bt horizons:

Value--6 or 7 dry, 4 or 5 moist; 5 dry and 3 moist in the upper part of some pedons.

Chroma--3 or 4.

Texture--Very cobbly clay loam, very cobbly loam or very gravelly clay loam.

Structure--Subangular blocky or angular blocky.

Consistence--Soft to slightly hard or hard, dry; very friable to friable, moist, slightly sticky to sticky, slightly plastic to plastic, wet.

Reaction--Neutral or mildly alkaline.

## Cliffdown Series

The Cliffdown series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium. The Cliffdown soils are on alluvial fans and inset fans. Slopes are 2 to 8 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Cliffdown gravelly sandy loam, in map unit 1304, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 30 percent pebbles.

A--0 to 3 inches; light brownish gray (10YR 6/2) gravelly sandy loam, brown (10YR 4/3) moist; weak moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; 25 percent pebbles; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

C1--3 to 12 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; 25 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C2--12 to 18 inches; light gray (10YR 7/2) very gravelly fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; 35 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C3--18 to 24 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 45 percent pebbles and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2C4--24 to 41 inches; light gray (10YR 7/2) stratified gravelly sandy loam to very gravelly fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 50 percent pebbles and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

3C5--41 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; many very fine and fine interstitial pores; 40 percent pebbles and 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** 100 feet south and 800 feet east of the northwest corner of section 28, T. 14 N., R. 37 E. (39 degrees, 4 minutes, 24 seconds north latitude; 117 degrees, 50 minutes, 23 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring and for 10 to 20 days cumulative between July to October following convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Effervescence:* Slightly effervescent to strongly effervescent, violently effervescent with depth.

*Reaction:* Moderately alkaline or strongly alkaline.

*Control section:*

Clay content--5 to 15 percent.

Rock fragments--Average 35 to 50 percent.

#### A horizon:

Hue--10YR or 7.5YR.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 through 4.

#### C horizons:

Texture--Stratified gravelly sandy loam to very gravelly fine sandy loam.

Consistence--Soft or slightly hard dry, nonsticky to slightly sticky and nonplastic to slightly plastic wet.

Other features--Some pedons have an A horizon with 1/2 unit of value darker than C horizon.

Some pedons contain weak Bk horizons. Some pedons have few thin lime coats on pebbles.

## Colbar Series

The Colbar series consists of moderately deep, well drained soils that formed in residuum and colluvium from rhyolitic and andesitic rocks. Colbar soils are on hills and mountains. Slopes are 15 to 50 percent. The

mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Xerollic Haplargids

**Typical pedon:** Colbar cobbly loam, in map unit 1860, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 15 percent pebbles and 25 percent cobbles.

A1--0 to 4 inches; pale brown (10YR 6/3) cobbly loam, dark brown (10YR 3/3) moist; weak medium platy structure, parting to moderate fine subangular blocky; soft, very friable, nonsticky and slightly plastic; common fine through medium roots; many very fine and fine interstitial pores; 10 percent pebbles, 20 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary.

A2--4 to 11 inches; pale brown (10YR 6/3) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; many very fine through fine roots; many very fine and fine interstitial pores; 20 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.6); clear smooth boundary.

Bt1--11 to 18 inches; yellowish brown (10YR 5/4) cobbly clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; few fine and medium tubular pores; common distinct clay films on faces of peds and lining pores; 10 percent pebbles, 15 percent cobbles, 5 percent stones; moderately alkaline (pH 8.2); clear wavy boundary.

Bt2--18 to 22 inches; yellowish brown (10YR 5/4) cobbly loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; common very fine through medium roots; few fine and medium tubular pores; common distinct clay films on faces of peds and lining pores; 10 percent pebbles, 15 percent cobbles, 5 percent stones; moderately alkaline (pH 8.2); clear wavy boundary.

R--22 inches; hard fractured rhyolitic bedrock, with soil and fine roots extending into fractures.

**Type location:** 300 feet west and 800 feet south of the northwest corner of section 24, T. 14 N., R. 37 E. (39 degrees, 04 minutes, 06 seconds north latitude; 117 degrees, 45 minutes, 35 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Dry during summer and autumn, moist in late winter and spring.

*Soil temperature:* 48 to 52 degrees F.

*Depth to bedrock:* 20 to 40 inches.

*Thickness of A and Bt horizons:* 11 to 24 inches.

*Control section:*

Clay content--25 to 35 percent.

Rock fragments--15 to 35 percent, mainly pebbles and cobbles.

Other features--Some pedons have Bk horizons with thin lime coats on undersides of rock fragments below the Bt horizon.

**A horizons:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Mildly alkaline or moderately alkaline.

**Bt horizons:**

Value--5 or 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Structure--Weak to strong, very fine to medium subangular blocky.

Consistence--Soft to hard, very friable to friable.

Texture--Cobbly loam, cobbly clay loam or gravelly clay loam.

Reaction--Mildly alkaline or moderately alkaline.

## Defler Series

The Defler series consists of very deep, well drained soils that formed in alluvium from mixed rock sources with a component of loess and volcanic ash. The Defler soils are on inset fans. Slopes are 2 to 4 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Defler gravelly fine sandy loam, in map unit 2241, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 15 percent pebbles.

A--0 to 3 inches; pale brown (10YR 6/3) gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak thick platy structure parting to moderate fine granular; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bk--3 to 16 inches; pale brown (10YR 6/3) gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 15 percent pebbles, thin lime coats on undersides of pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bqk--16 to 20 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky; soft, very friable, nonsticky and nonplastic; many very fine roots; common very fine interstitial pores; 40 percent pebbles; many disseminated lime and common medium lime and silica coats cover rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

B'k2--20 to 33 inches; pale brown (10YR 6/3) stratified very gravelly sandy loam to extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; 55 percent pebbles, 10 percent cobbles; common thin lime coatings on undersides of rock fragments; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

B'k3--33 to 43 inches; pale brown (10YR 6/3) stratified gravelly coarse sand to gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine tubular pores; 5 percent pebbles; violently effervescent; lime coating underside of rock fragments and common soft lime filaments; moderately alkaline (pH 8.4); clear wavy boundary.

2C--43 to 60 inches; pale brown (10YR 6/3) stratified very gravelly coarse sand to very gravelly sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots, common very fine and fine interstitial pores; 45 percent pebbles and 5 percent cobbles; moderately alkaline (pH 8.4).

**Type location:** 1,500 feet east and 2,400 feet south of the northwest corner of section 28, T. 14 N., R. 47 E. (39 degrees, 1 minute, 20 seconds north latitude; 116 degrees, 41 minutes, 16 seconds west longitude.)

### Range in characteristics:

*Soil moisture:* Moist in some part during November through May; dry from June through October.

*Soil temperature:* 47 to 52 degrees F.

*Depth to 2C horizon:* 35 to 45 inches.

*Reaction:* Mildly alkaline to strongly alkaline.

*Control section:*

Clay content--8 to 18 percent.

Rock fragments--Averages 35 to 60 percent, mainly pebbles.

**A horizon:**

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

**Bk and Bqk horizons:**

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Very gravelly fine sandy loam, very gravelly loam, or very gravelly sandy loam when averaged.

Structure--Subangular blocky or massive or single grained.

Consistence--Slightly hard, soft or loose, very friable or firm, nonsticky or slightly sticky, nonplastic or slightly plastic.

Carbonates--Secondary carbonates as filaments or coatings on rock fragments.

Effervescence--Strongly effervescent to violently effervescent.

Cementation--Any strata below 12 inches, may contain 5 to 15 percent weakly silica cemented durinodes.

#### 2C horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Stratified very gravelly sandy loam to extremely gravelly coarse sand.

Rock fragments--50 to 70 percent, mainly pebbles.

## Dewar Series

The Dewar series consists of well drained soils that are shallow to a duripan and formed in loess and silty alluvium from mixed rock sources with a component of volcanic ash. Dewar soils are on fan piedmonts. Slopes are 2 to 8 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Dewar gravelly loam, in map unit 1452, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 40 percent pebbles.

A--0 to 3 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderately thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary.

Bt--3 to 7 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and plastic; common very fine through coarse roots; many very fine interstitial and tubular pores; few thin clay films on faces of peds; 30 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary.

Btqk--7 to 15 inches; very pale brown (10YR 7/4) gravelly silt loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky

and slightly plastic; common very fine, fine and medium roots; common very fine interstitial and tubular pores; many pan fragments in lower portion of horizon; few thin clay films on peds; 30 percent pebbles; violently effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bqkm1--15 to 25 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/4) moist; moderate thick and very thick plate like layers; extremely hard, extremely firm; few roots along horizontal fractures; common very fine tubular pores; continuous 1/2 to 2 millimeter thick brown (10YR 4/3) horizontal silica lamina at upper surface and in horizontal bands throughout horizon; violently effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

Bqkm2--25 to 44 inches; white (10YR 8/2) indurated duripan, very pale brown (10YR 7/4) moist; massive; extremely hard, extremely firm; common very fine tubular pores; continuous 1 to 5 millimeter thick brown (10YR 4/3) horizontal silica lamina at upper surface; 40 percent pebbles, 5 percent cobbles, 4 percent stones; violently effervescent; strongly alkaline (pH 8.6); gradual wavy boundary.

Bqkm3--44 to 60 inches; very pale brown (10YR 7/3) continuous strongly silica and lime cemented duripan, brownish yellow (10YR 6/6) moist; massive; very hard, very firm, brittle wet; many very fine interstitial pores; 50 percent pebbles, 10 percent cobbles, 4 percent stones; violently effervescent; very strongly alkaline (pH 9.2).

**Type location:** 1,200 feet west and 2,500 feet north of the southeast corner of section 7, T. 8 N., R. 46 E. (38 degrees, 32 minutes, 57 seconds north latitude; 116 degrees, 50 minutes, 23 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in winter and spring, dry early June through October.

**Soil temperature:** 47 to 52 degrees F.

**Depth to indurated duripan:** 14 to 20 inches.

**Reaction:** A and Bt horizons are neutral to moderately alkaline.

#### Control section:

Clay content--27 to 35 percent

Rock fragments--Averages 15 to 35 percent, dominantly pebbles

#### A horizon:

Value--3 or 4 moist.

Chroma--2 or 3.

#### Bt horizons:

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4 dry, 3 or 4 moist.

Texture--Gravelly silty clay loam or gravelly clay loam.  
 Clay content--27 to 35 percent.  
 Rock fragments--15 to 35 percent, mainly pebbles.  
 Structure--Weak through strong, fine through coarse subangular blocky.  
 Consistence--Slightly hard or hard, dry; very friable or friable, moist; slightly sticky or sticky, wet.

**Btqk horizon:**

Clay content--25 to 30 percent.  
 Texture--Gravelly silty clay loam, gravelly clay loam or gravelly silt loam.  
 Rock fragments--15 to 35 percent. Subhorizons with up to 45 percent pebbles are in some pedons.  
 Durinodes--Weak or very weak, less than 30 percent.  
 Silica cementation--Few thin pendant on pebbles are in some pedons.

**Bqkm horizons:**

Structure--Massive or moderately thick or very thick plate-like layers.  
 Cementation--Some pedons are alternately strongly cemented or discontinuously indurated horizons below the duripan.  
 Other features--In some pedons, a 1 to 3 inch zone of degraded duripan material is common along the upper horizon boundary.

**Downeyville Series**

The Downeyville series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from andesite, rhyolite and metavolcanic rock. Downeyville soils are on hills, mountain slopes, pediments and mesas. Slopes are 8 to 50 percent. Mean annual precipitation is about 5 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Haplargids

**Typical pedon:** Downeyville very cobbly fine sandy loam, in map unit 1227, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 35 percent pebbles and 25 percent cobbles.

A1--0 to 1 inch; pale brown (10YR 6/3) very cobbly fine sandy loam, dark brown (10YR 3/3) moist; weak fine platy structure; soft, very friable, nonsticky and nonplastic; common very fine roots; few fine vesicular pores; 35 percent pebbles; 20 percent cobbles; moderately alkaline (pH 8.4); clear smooth boundary.

A2--1 to 4 inches; pale brown (10YR 6/3) very cobbly fine sandy loam, dark brown (10YR 3/3) moist;

weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common fine tubular pores; 35 percent pebbles; 20 percent cobbles; moderately alkaline (pH 8.2); clear smooth boundary.

Btk1--4 to 7 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; common fine tubular pores; few thin lime coating underside of rock fragments; few thin clay films on faces of peds, lining pores and coating sand grains; 45 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Btk2--7 to 10 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common fine tubular pores; few thin clay films on faces of peds, lining pores and coating sand grains; 40 percent pebbles; 15 percent cobbles; few thin lime coatings on the underside of rock fragments; strongly effervescent; moderately alkaline (pH 8.3); abrupt wavy boundary.

R--10 inches; hard andesite, upper two inches weathered andesite.

**Type location:** 500 feet south and 1,600 feet west of the northeast corner of section 15, T. 4 N., R. 47 E. (38 degrees, 12 minutes, 11 seconds north latitude; 116 degrees, 41 minutes, 53 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 57 degrees F.

**Depth to bedrock:** 4 to 14 inches.

**Reaction:** Moderately alkaline or strongly alkaline.

**Control section:**

Clay content--14 to 25 percent.

Rock fragments--35 to 60 percent.

**A horizons:**

Hue--7.5YR or 10YR.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 or 3.

Carbonates--Noneffervescent to strongly effervescent.

**Btk horizons:**

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture (fine-earth fraction)--Loam, fine sandy loam and some pedons may have silt loam subhorizons.

Clay content--18 to 27 percent.

Rock fragments--Average 5 to 20 percent cobbles and stones; 30 to 50 percent pebbles.

Structure--Platy or subangular blocky.

Consistence--Soft to hard dry, very friable or friable moist, slightly sticky or sticky and nonplastic or slightly plastic wet.

Carbonates--Carbonates and accessory silica in the form of pendants on the underside of pebbles ranging from few to many. Slightly effervescent to violently effervescent in lower part.

Other features--The upper part of the Bt horizon may not contain visible lime accumulation or may not be effervescent in some pedons.

masses; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

2Cq1--30 to 35 inches; light gray (10YR 7/2) finely stratified silt loam, brown (10YR 4/3) moist with common fine distinct dark yellowish brown (10YR 4/4 and 10YR 3/4) mottles; massive; hard, firm, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; discontinuous brittle silica cementation; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

2Cq2--35 to 39 inches; light gray (10YR 7/2) finely stratified silt loam, olive (5Y 5/3) moist, with common fine distinct olive (5Y 4/4) mottles; massive; hard, firm, slightly sticky and slightly plastic; few fine roots; common fine tubular pores; discontinuous brittle silica cementation; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

3C--39 to 45 inches; pale yellow (5Y 7/3) finely stratified gravelly to silt loam, olive (5Y 5/3) moist, with common fine distinct olive (5Y 5/4, 5/6 and 4/4) mottles; massive; soft, very friable, nonsticky and nonplastic; very few fine roots; many very fine interstitial, and few very fine and fine tubular pores; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

4C--45 to 60 inches; pale yellow (5Y 7/3) gravelly sand, olive (5Y 5/3) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; 20 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6).

**Type location:** 2,000 feet south and 800 feet east of the northwest corner of section 7, R. 47 E., T. 10 N. (38 degrees, 43 minutes, 27 seconds north latitude; 116 degrees, 44 minutes, 4 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Dry in mid-summer and early fall, moist mid-October through mid-July. Apparent seasonal water table is between 2.5 to 3.5 feet early spring to early summer. Drained phases are recognized.

**Soil temperature:** 52 to 56 degrees F.

**Depth of Cq horizon:** 6 to 17 inches.

**Profile reaction:** Moderately alkaline to very strongly alkaline, decreasing in alkalinity with increasing depth.

**Other features:** Thin strata of volcanic ash up to 4 inches thick are in some pedons. Some pedons have strongly cemented duripans at 40 to 60 inches.

**Control section:**

Clay content--10 to 15 percent, when mixed.

Mottles--High chroma and yellowish hue iron mottles and dark manganese mottles are common in most pedons below a depth of 6 inches.

## Dunphy Series

The Dunphy series consist of very deep, somewhat poorly drained soils formed in alluvium from predominantly volcanic sources with an admixture of volcanic ash. The Dunphy soils are on alluvial flats. Slopes are 0 to 2 percent. Mean annual precipitation is about 7 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Dunphy silt loam, in map unit 2321, rangeland. (Colors are for dry soil unless otherwise stated). Approximately 1/8 inch thick hard salt crust on the surface.

A1--0 to 1 inch; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine vesicular pores; very strongly alkaline (pH 9.6); abrupt smooth boundary. (0 to 1 1/2 inches thick)

A2--1 to 15 inches; light gray (10YR 7/2) silt loam, brown (10YR 4/3) moist; weak very thin and thin platy structure parting to moderate fine subangular blocky; soft, very friable, slightly sticky and slightly plastic; many very fine and medium roots; common fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

Cqk--15 to 30 inches; pale brown (10YR 6/3) stratified sandy loam to silt loam, brown (10YR 4/3) moist with common medium distinct dark yellowish brown (10YR 4/4) dark brown (10YR 3/3) and very dark brown (10YR 2/2) mottles; massive; hard, friable, slightly sticky and slightly plastic; common very fine, and few fine roots; few very fine and fine tubular pores; many very thin discontinuous olive brown (2.5Y 4/4) very hard, firm and brittle silica-cemented lenses and bands; common soft lime

**A horizons:**

Hue--10YR through 5Y.  
 Value--6 through 8 dry, 4 through 6 moist.  
 Chroma--2 through 4.  
 Consistence--Soft to very hard, dry. Very hard consistence is only in areas that are strongly affected by sodium. Consistence is never hard or very hard when massive.  
 Effervescence--Noneffervescent to violently effervescent.  
 Sodium absorption ratio--50 to 65

**C and Cq horizons:**

Hue--10YR through 5Y.  
 Value--6 through 8 dry, 4 through 6 moist.  
 Chroma--2 through 4.  
 Consistence--Weakly silica cemented horizons are hard to extremely hard, dry. Noncemented horizons are friable or very friable moist.  
 Texture--Stratified from gravelly sand to silty clay loam, but is dominantly very fine sandy loam, silt loam, or fine sandy loam.  
 Consistence--Soft to hard or loose, very friable, firm or loose, slightly sticky or nonsticky, slightly plastic or nonplastic.  
 Effervescence--Effervescent throughout except for thin strata of volcanic ash in some pedons.  
 Sodium absorption ratio--25 to 46  
 Cementation--Continuous weakly brittle matrix horizons, interstratified with horizons that lack silica accumulation or contains durinodes in a friable or very friable matrix.

**Eastgate Series**

The Eastgate series consists of very deep, well drained soils that formed from mixed alluvium and aeolian deposits on nearly level to gently sloping alluvial fans, fan skirts and fan piedmonts often with sand sheets. Slopes are 0 to 8 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Typic Camborthids

**Typical pedon:** Eastgate gravelly loamy sand, in map unit 1004, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 20 percent pebbles.

A1--0 to 2 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 20 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

A2--2 to 5 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; many very fine interstitial pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Bw--5 to 17 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common fine, many very fine and few medium roots; many very fine interstitial pores; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.3); abrupt wavy boundary.

Bk1--17 to 25 inches; light gray (10YR 7/2) gravelly loamy sand, brown (10YR 5/3) moist; massive; hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial and tubular pores; 15 percent pebbles; common thin lime pendants on underside of pebbles; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary.

2Bk1--25 to 40 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive, soft, very friable, nonsticky and nonplastic; many very fine, common fine roots; many very fine and fine interstitial pores; 35 percent pebbles; common thin lime pendants on underside of pebbles; violently effervescent; very strongly alkaline (pH 9.6); clear wavy boundary.

2Bk2--40 to 54 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; many very fine and fine interstitial pores; 45 percent pebbles; common thin lime pendants on underside of pebbles; violently effervescent; very strongly alkaline (pH 9.4); abrupt wavy boundary.

2Bk3--54 to 60 inches; white (10YR 8/2) very gravelly loamy sand, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; common very fine interstitial pores; 50 percent pebbles; weak lime coatings on underside of pebbles; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** Nye County, Nevada; about 1,700 feet west and 800 feet north of the southeast corner of section 1, T. 12 N., R. 35 E. (38 degrees, 55 minutes, 36 seconds north latitude; 117 degrees, 59 minutes, 8 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months, and for 10 to 20 days cumulative between July to October due to convection storms. Dry in lower part of moisture control section.

*Soil temperature:* 53 to 59 degrees F.  
*Depth to base of Bw horizon:* 14 to 20 inches.

**Control section:**

Rock fragments--15 to 35 percent pebbles (after mixing).

**A horizons:**

Value--6 or 7 dry, 4 or 5 moist.  
 Chroma--2 or 3.  
 Reaction--Moderately alkaline or strongly alkaline.  
 Effervescence--Slightly effervescent to strongly effervescent (due to carbonate recharge).

**Bw horizon:**

Value--6 or 7 dry, 4 or 5 moist.  
 Chroma--2 or 3.  
 Texture--Sandy loam or gravelly sandy loam.  
 Clay content--8 to 15 percent.  
 Structure--Prismatic or subangular blocky.  
 Reaction--Moderately alkaline or strongly alkaline.  
 Effervescence--Noneffervescent to strongly effervescent (due to carbonate recharge).  
 Rock fragments--5 to 20 percent pebbles.

**Bk horizon:**

Value--6 or 7 dry, 4 or 5 moist.  
 Chroma--2 or 3.  
 Texture--Loamy sand or gravelly loamy sand.  
 Rock fragments--5 to 20 percent pebbles.  
 Consistence--Slightly hard to hard dry.  
 Reaction--Moderately alkaline or strongly alkaline.  
 Effervescence--Strongly effervescent or violently effervescent.

**2Bk horizons:**

Value--6 through 8 dry, 4 or 5 moist.  
 Chroma--2 or 3.  
 Texture--Very gravelly loamy sand with thin strata of very gravelly sandy loam in some pedons.  
 Consistence--Soft to hard dry, very friable to firm.  
 Rock fragments--35 to 50 percent pebbles, 0 to 5 percent cobbles.  
 Reaction--Strongly alkaline or very strongly alkaline.  
 Few to many lime pediments and coats on rock fragments (less than 5 percent by volume).

## Easychair Series

The Easychair series consists of very deep, well drained soils that formed in mixed alluvium. Easychair soils are on inset fans. Slopes are 0 to 4 percent. The mean annual precipitation is about 5 inches and the mean annual temperature is about 55 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Easychair silt loam, in map unit 1021, rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; very pale brown (10YR 7/3) silt loam, yellowish brown (10YR 5/4) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine vesicular pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

A2--2 to 11 inches; light yellowish brown (10YR 6/4) silt loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; very fine through medium roots; common fine tubular pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

C1--11 to 16 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary. (2 to 8 inches)

C2--16 to 28 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

C3--28 to 41 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C4--41 to 60 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

**Type location:** 100 feet south and 200 feet east of the northwest corner of section 17, T. 5 N., R. 48 E. (38 degrees, 17 minutes, 41 seconds north latitude; 116 degrees, 37 minutes, 57 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some parts for short periods during winter and early spring and for 10 to 20 days cumulative between July to October due to convection storms.

*Mean annual soil temperature:* 53 to 59 degrees F.

*Profile reaction:* Moderately alkaline or strongly alkaline.

*Carbonates:* Slightly effervescent or strongly effervescent above 40 inches.

*Control section:*

Clay content--Averages 18 to 25 percent.  
Rock fragments--0 to 5 percent pebbles.

**A horizons:**

Value--6 or 7 dry, 4 or 5 moist.  
Chroma--3 or 4.

**C horizons:**

Value--5 through 7 dry, 4 or 5 moist.  
Chroma--3 or 4.  
Texture--Silt loam, with fine strata of sandy loam or fine sandy loam, may be sandy loam below 40 inches in some pedons.  
Clay content--18 to 25 percent in upper part, 8 to 25 percent below 40 inches.  
Rock fragments--0 to 5 percent pebbles.  
Structure--Platy, blocky or massive.  
Consistences--Nonsticky or slightly sticky and nonplastic or slightly plastic.

## Enko Series

The Enko series consists of very deep, well drained soils that formed in loamy alluvium weathered mainly from mixed rock sources with a component of loess and volcanic ash. Enko soils are on inset fans, and fan skirts. Slopes are 0 to 2 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Enko sandy loam, in map unit 2220, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 5 inches; light brownish gray (10YR 6/2) sandy loam, brown (10YR 4/3) moist; weak moderately thick platy parting structure to weak very fine and fine granular; soft, very friable, slightly sticky and slightly plastic; few fine roots; common very fine and fine vesicular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bw--5 to 15 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate fine subangular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bqk1--15 to 31 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine, fine and medium roots; common very fine and fine tubular pores; 20 percent very hard lime and silica coated durinodes; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bqk2--31 to 60 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; hard, firm and brittle; common very fine tubular pores; few fine and medium lime filaments; fractured weak silica lime cementation; continuous brittle matrix; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** 200 feet north and 1,200 feet east of the southwest corner of section 2, T. 15 N., R. 47 E. (39 degrees, 10 minutes, 14 seconds north latitude; 116 degrees, 39 minutes, 03 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry; moist in winter and spring, dry June through October.

*Soil temperature:* 49 to 54 degrees F.

*Thickness of A and Bw horizons:* 12 to 30 inches.

*Depth to continuous brittle matrix:* 12 to 32 inches.

*Depth to calcium carbonate:* 10 to 30 inches.

*Other features:* Below 40 inches some pedons have gravelly or sandy substrata, or substrata containing gypsum crystals. Some pedons have noneffervescent Bq horizons above the Bqk horizon.

**Control section:**

Clay content--10 to 18 percent.

Rock fragments--0 to 15 percent pebbles.

**A horizon:**

Hue--10YR or 2.5Y.

Value--Commonly 6 or 7 dry, with 5 dry in some subhorizons of some pedons, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

**Bw horizon:**

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Loam, fine sandy loam, or sandy loam; some pedons have strata of silt loam or clay loam in the upper part where stratified.

Structure--Prismatic, angular blocky, subangular blocky or it is massive.

Consistence--Soft or slightly hard dry, very friable or friable, moist, nonsticky, slightly sticky or sticky, nonplastic, slightly plastic or plastic, wet.

Reaction--Neutral to moderately alkaline, increasing with depth.

Carbonates--Some pedons are calcareous in the lower portion of the horizon.

**Bqk horizons:**

Hue--10YR, 2.5Y, 5Y.

Value--6 through 8 dry, 4 through 7 moist.

Chroma--1 through 4 dry, 2 through 4 moist.

Texture--Loam, sandy loam, fine sandy loam, gravelly sandy loam or very fine sandy loam.

Silica cementation--Continuous brittle matrix that is at least firm consistence when moist in horizons 10 to 40 inches thick. Subhorizons not continuously brittle and contain 20 to 50 percent durinodes or are 20 to 75 percent discontinuous weakly silica-cemented.

Structure--Platy or is massive.

Consistence--Soft to hard, dry; very friable to firm, moist; nonsticky or slightly sticky and nonplastic or slightly plastic or brittle when wet. Substrata that are very friable, moist are in some pedons.

Reaction--Mildly alkaline to very strongly alkaline commonly increasing with depth.

Other features--Relict iron mottles are common in many pedons. Very gravelly or extremely gravelly substratum phases are common below depths of 40 inches in some pedons. Some pedons have a high content of mica in the sand sized fraction.

friable, slightly sticky and nonplastic; common very fine and fine roots; common fine tubular pores; 25 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary.

C--25 to 60 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; 20 percent pebbles, 5 percent cobbles; neutral (pH 7.0).

**Type location:** 300 feet south and 300 feet west of the northeast corner of section 8, T. 1 N., R. 49 E. (37 degrees, 56 minutes, 57 seconds north latitude; 116 degrees, 30 minutes, 47 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually moist, moist in winter and early spring, dry summer and fall, but moist intermittently due to convection storms; dry in all parts at least 45 consecutive days following summer solstice, dry 90 to 100 days cumulative.

*Soil temperature:* 44 to 47 degrees F.

*Mollic epipedon thickness:* 16 to 25 inches.

*Depth to bedrock:* Greater than 60 inches.

*Control section:*

Clay content--8 to 15 percent.

Rock fragments--15 to 35 percent.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 through 3.

#### Bw horizon:

Value--4 through 6 dry, 2 through 4 moist.

Chroma--2 or 3.

Texture--Sandy loam or loam.

Clay content--8 to 15 percent.

Rock fragments--15 to 35 percent.

#### C horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Sandy loam or loam.

Clay content--8 to 15 percent.

Rock fragments--15 to 35 percent.

## Foxvire Series

The Foxvire series consists of very deep, well drained soils that formed in colluvium from volcanic rocks. Foxvire soils are on concave mountain side slopes (snow pockets). Slopes are 30 to 75 percent. The mean annual precipitation is about 15 inches and the mean annual temperature is about 43 degrees F.

**Taxonomic class:** Coarse-loamy, mixed Pachic Cryoborolls.

**Typical pedon:** Foxvire gravelly loam, in map unit 1540, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent pebbles and 5 percent cobbles.

A1--0 to 5 inches; gray (10YR 5/1) gravelly loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; many fine interstitial pores; 20 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary.

A2--5 to 10 inches; grayish brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; many fine tubular pores; 10 percent pebbles; neutral (pH 7.0); clear smooth boundary.

A3--10 to 20 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine tubular pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary.

Bw--20 to 25 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; soft, very

## Gabbvally Series

The Gabbvally series consists of shallow and very shallow, well drained soils that formed in residuum and colluvium from volcanic rocks. Gabbvally soils are on hills, plateaus, mesas, and mountain sideslopes. Slopes are 8 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Gabbvally very gravelly sandy loam, in map unit 1100 rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 45 percent pebbles, 5 percent cobbles.

A--0 to 2 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common fine roots; common very fine vesicular pores; 35 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary.

Bt1--2 to 6 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common very fine tubular pores; common moderately thick clay films on faces of peds; 40 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary.

Bt2--6 to 9 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine through coarse roots; common very fine tubular pores; common thin and few moderately thick clay films on faces of peds; 40 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.6); abrupt irregular boundary.

R--9 inches; hard fractured rhyolitic tuff; few roots and lime in fractures.

**Type location:** 600 feet north and 600 feet west of the southeast corner of section 6, T. 10 N., R. 37 E. (38 degrees, 45 minutes, 05 seconds north latitude; 117 degrees, 53 minutes, 45 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in winter and spring months, dry in summer and fall except for 10 to 20 days between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to bedrock:** 6 to 14 inches.

**Reaction:** Neutral or mildly alkaline.

**Control section:**

Clay content--15 to 25 percent.

Rock fragments--35 to 50 percent, predominantly pebbles.

**A horizon:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4 dry or moist.

**Bt horizons:**

Clay content--18 to 27 percent.

Value--5 or 6 dry, 3 through 5 moist.

Chroma--3 or 4 dry or moist.

Texture--Sandy clay loam, loam, sandy loam.

Rock fragments--35 to 50 percent.

Structure--Subangular blocky or angular blocky

Consistence--Soft or slightly hard, very friable or friable, slightly sticky or sticky.

## Garhill Series

The Garhill series consists of shallow and very shallow over an indurated duripan, well drained soils that formed in residuum and colluvium weathered from basalt bedrock and aeolian material. Garhill soils are on hills, mesas, and plateaus. Slopes are 4 to 30 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durorthids

**Typical pedon:** Garhill very stony loamy fine sand, in map unit 1851, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 5 percent stones, 10 percent cobbles, and 40 percent pebbles.

A1--0 to 1 inch; pale brown (10YR 6/3) very stony loamy fine sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine interstitial pores; 40 percent pebbles, 10 percent cobbles, 5 percent stones; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2--1 to 4 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine vesicular; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bk--4 to 8 inches; light yellowish brown (10YR 6/4) gravelly loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; soft, very friable, sticky and slightly plastic; common very fine and fine roots; common fine tubular interstitial pores; 25 percent pebbles, 5 percent cobbles; common thick lime pediments on underside of rock fragments; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

2Bqkm--8 to 15 inches; indurated duripan, 1/4 inch to 1/2 inch continuous laminar cap alternating with strongly cemented lime and silica; abrupt irregular boundary.

R--15 inches; hard, fractured basalt bedrock with the duripan protruding down into fractures.

**Type location:** 800 feet north and 800 west of the southeast corner of section 6, T. 2 N., R. 46 E. (38 degrees, 03 minutes, 01 seconds north latitude; 116 degrees, 51 minutes, 33 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 56 to 59 degrees F.

*Depth to duripan:* 7 to 14 inches.

*Depth to bedrock:* 12 to 30 inches.

Other features--Pan fragments and lime accumulation are common in subhorizons immediately above duripan in most pedons.

**Control section:**

Percent clay--10 to 18 percent.

Rock fragments--15 to 25 percent.

**A horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Carbonates--Noneffervescent to violently effervescent.

**Bk horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Loam or sandy loam.

Clay content--18 to 25 percent.

Rock fragments--15 to 35 percent, mainly pebbles.

Structure--Weak or moderate subangular blocky or platy.

Consistence--Soft or slightly hard dry.

Reaction--Moderately alkaline or strongly alkaline.

**Bqkm horizon:**

Value--7 or 8 dry, 5 through 7 moist.

Chroma--1 through 3 dry, 3 or 4 moist.

Structure--Platy or is massive.

Other features--1/8 to 3/4 inch continuous laminar cap. Somewhat fractured indurated duripan with pockets of weakly cemented material.

## Geer Series

The Geer series consists of very deep, well drained soils that formed in alluvium from mixed sources with a minor component of glass and other pyroclastic material. The Geer soils are on alluvial plains, inset fans and fan skirts. Slopes are 0 to 4 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Geer fine sandy loam, in map unit 1230, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is partially covered with 5 percent pebbles.

A1--0 to 1 inch; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and nonplastic; common very fine and medium vesicular pores; strongly effervescent; moderately alkaline (pH 7.9); abrupt smooth boundary.

A2--1 to 4 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, sticky and slightly plastic; common fine roots; few fine tubular pores; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

C1--4 to 16 inches; pale brown (10YR 6/3) finely stratified very fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

C2--16 to 28 inches; pale brown (10YR 6/3) finely stratified very fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C3--28 to 35 inches; pale brown (10YR 6/3) finely stratified very fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C4--35 to 60 inches; pale brown (10YR 6/3) finely stratified fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and plastic; few fine roots; strongly effervescent; moderately alkaline (pH 8.3).

**Type location:** 900 feet north and 2,200 feet east of the southwest corner of section 19, T. 4 N., R. 49 E. (38 degrees, 10 minutes, 39 seconds north latitude; 116 degrees, 32 minutes, 12 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to summer convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Other features:* Gravelly layers are in some pedons below 40 inches.

**Control section:**

Clay content--Averages less than 18 percent.

Other features--Averages 15 to 30 percent fine sand or coarser. Mineralogy has minor influence of volcanic ash, glass, and other pyroclastic material.

**A horizons:**

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Carbonates--Slightly effervescent or strongly effervescent.

**C horizons:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Stratified fine sandy loam to silt loam.

Consistence--Soft or slightly hard, nonsticky to sticky and nonplastic to plastic.

Reaction--Moderately alkaline to very strongly alkaline.

Carbonates--Strongly effervescent or violently effervescent.

Other features--Some fine or medium lime segregations are in strata below 20 inches in some pedons. Few or common faint high chroma iron mottles are below 40 inches in some cultivated areas.

moderate coarse prismatic structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; many very fine and fine tubular pores; strongly effervescent; very strongly alkaline (pH 9.2); abrupt smooth boundary.

C--14 to 29 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; massive; soft, very friable, sticky and plastic; common very fine through medium roots; many very fine and fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.9); gradual wavy boundary.

2Cy1--29 to 47 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; massive; soft, very friable, sticky and plastic; few very fine through medium roots; many very fine and fine interstitial pores; many large salt masses; slightly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

2Cy2--47 to 60 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; massive; slightly hard to hard, friable, sticky and plastic; few very fine and fine roots; common very fine and fine interstitial pores; strongly effervescent; many large salt masses; strongly alkaline (pH 8.8).

**Type location:** 350 feet east and 2,200 feet north of the southwest corner of section 7, T. 11 N., R. 36 E. (38 degrees, 49 minutes, 49 seconds north latitude; 117 degrees, 58 minutes, 50 seconds west longitude.)

## Gitakup Series

The Gitakup series consists of very deep, moderately well drained soils that formed in silty alluvium lacustrine sediments. Gitakup soils are on lake plain terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 51 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Natric Camborthids

**Typical pedon:** Gitakup silty clay loam, in map unit 1494, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 1 inch; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine tubular and interstitial pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary.

Bwn1--1 to 3 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; weak medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine tubular and interstitial pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary.

Bwn2--3 to 14 inches; pale brown (10YR 6/3) silty clay loam, dark yellowish brown (10YR 4/4) moist;

### Range in characteristics:

*Soil moisture:* Usually dry, moist for short periods in winter and spring, dry in summer and fall.

*Soil temperature:* 53 to 59 degrees F.

*Profile reaction:* Strongly alkaline or very strongly alkaline.

*Control section:*

Clay content averages 27 to 35 percent.

**A horizon:**

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Sodium absorption ratio--More than 13

**Bwn horizons:**

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 dry, 3 or 4 moist.

Texture--Silty clay loam or silty clay.

Sodium absorption ratio--More than 45 in all parts.

Consistence--Soft to slightly hard, slightly sticky to very sticky, slightly plastic to very plastic.

**C horizon:**

Hue--10YR, 2.5Y or 5Y.

Value--5 through 7 dry.

Chroma--2 through 4.

Texture--Dominantly silty clay loam, but may be stratified silt loam thru silty clay.  
Sodium absorption ratio--More than 13  
Consistence--Soft to slightly hard, slightly sticky to sticky, slightly plastic to plastic.

**2Cy horizons:**

Hue--10YR, 2.5YR or 5Y  
Value--5 through 7 dry  
Chroma--2 through 4  
Texture--Dominantly silty clay loam, but may be stratified silt loam through silty clay.  
Consistence--Soft or hard, very friable to friable.

**Goldyke Series**

The Goldyke series consists of very shallow, well drained soils that formed in residuum and colluvium from rhyolite and rhyolite tuffs. Goldyke soils are on hills and rock pediments. Slopes are 4 to 30 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents.

**Typical pedon:** Goldyke gravelly sandy loam, in map unit 1835, rangeland. (Colors are for dry soils unless otherwise noted.) The surface of the soil is covered with 30 percent angular, small rhyolite pebbles.

A--0 to 3 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial pores; 20 percent pebbles, mostly less than 3/4 inch diameter; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

C--3 to 6 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; many very fine and few fine interstitial pores; 15 percent pebbles, mostly less than 3/4 inch diameter; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Cr--6 to 22 inches; yellowish brown (10YR 5/6) highly decomposed rhyolite bedrock, dark yellowish brown (10YR 4/6) moist, common fine black mineral stains resembling mottles; strong rock structure; common very fine and fine roots in cracks; few lime and silica coatings in cracks and lower sides of fragments; violently effervescent.

R--22 inches; hard rhyolite.

**Type location:** 300 feet north and 400 feet east of the southwest corner of section 32, T. 11 N., R. 36 E.

(38 degrees, 46 minutes, 9 seconds north latitude; 117 degrees, 57 minutes, 40 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during the winter and early spring months, and for 10 to 20 days during July through October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to paralithic contact:** 4 to 10 inches.

**Depth to hard rock:** 20 to 40 inches.

**Control section:**

Clay content--10 to 18 percent.

Rock fragments--15 to 35 percent pebbles.

**A horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Rock fragments--20 to 35 percent pebbles.

Effervescence--Slightly effervescent to strongly effervescent.

**C horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Sandy loam or fine sandy loam.

Rock fragments--15 to 35 percent pebbles.

Effervescence--Slightly effervescent to strongly effervescent.

**Cr horizon:**

Color--Highly variable, ranges from white or gray to brown, red, green or violet.

**Grassval Series**

The Grassval series consists of shallow and very shallow over an indurated duripan, well drained soils that formed in alluvium from mixed rock sources. Grassval soils occur on fan piedmont remnants. Slopes are 2 to 15 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Grassval gravelly loam, in map unit 1451 rangeland. (Colors are for dry soils unless otherwise noted.) The surface is covered with approximately 35 percent gravel.

A--0 to 3 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, very friable, nonsticky and slightly plastic; common fine through medium roots; many fine and medium vesicular pores; 15 percent

pebbles; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bt--3 to 9 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; common through coarse roots; common fine and medium tubular pores; common thin clay films on peds; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Btk--9 to 13 inches; light yellowish brown (10YR 6/4) gravelly loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; common fine tubular pores; few thin clay films on faces of peds; 25 percent pebbles, 5 percent cobbles; lime coats on undersides of pebbles and many fine and medium soft masses; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

Bqkm--13 to 60 inches; white (10YR 8/1) indurated duripan with thin horizontal lenses that are weakly or strongly cemented; violently effervescent.

**Type location:** 500 feet east and 1,400 feet north of the southwest corner of section 2, T. 8 N., R. 46 E. (38 degrees, 33 minutes, 37 seconds north latitude; 116 degrees, 46 minutes, 46 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring, dry early June through October.

*Soil temperature:* 47 to 50 degrees F.

*Depth to duripan:* 8 to 14 inches.

*Depth to carbonates:* Calcareous throughout, effervescence increasing with depth; segregated lime common in lower portion of the solum.

#### Control section:

Percent clay--18 to 27 percent.

Rock fragments--15 to 35 percent, mainly pebbles.

#### A horizon:

Value--3 or 4 moist.

Chroma--2 or 3.

Reaction--Mildly alkaline or moderately alkaline.

#### Bt horizon:

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Gravelly loam or gravelly clay loam.

Clay content--25 to 35 percent.

Structure--Prismatic or subangular blocky structure.

Consistence--Slightly hard or hard, slightly sticky or sticky and slightly plastic or plastic.

Reaction--Moderately alkaline or strongly alkaline.

## Gynelle Series

The Gynelle series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium. Gynelle soils are on inset fans, alluvial flats and fan skirts. Slopes are 0 to 8 percent. Mean annual precipitation is about 4 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Gynelle very gravelly loamy sand, in map unit 2150, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 60 percent pebbles and 5 percent cobbles.

A1--0 to 3 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; common very fine and fine interstitial pores; 40 percent pebbles, 5 percent cobbles, slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

A2--3 to 8 inches; pale brown (10YR 6/3) very gravelly sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine and fine interstitial pores; 50 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bk--8 to 16 inches; pale brown (10YR 6/3) finely stratified very gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; 50 percent pebbles, 5 percent cobbles; few thin lime coating on underside of rock fragments; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

2C1--16 to 36 inches; pale brown (10YR 6/3) finely stratified extremely cobbly sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine interstitial pores; 40 percent pebbles, 25 percent cobbles, 5 percent stones; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

3C2--36 to 60 inches; pale brown (10YR 6/3) finely stratified very gravelly coarse sand, brown (10YR 4/3) moist; massive, slightly hard, very friable, nonsticky and nonplastic; common fine interstitial pores; 40 percent pebbles, 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** 300 feet south and 300 feet east of the northwest corner of section 8, T. 12 N. R. 34 E. (38 degrees, 55 minutes, 36 seconds north latitude; 118 degrees, 10 minutes, 55 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms. Dry in the lower moisture control section.

**Soil temperature:** 55 to 59 degrees F.

**Depth to Bk horizon:** 4 to 14 inches.

**Carbonates:** Slightly effervescent to violently effervescent.

**Control section:**

Rock fragments--35 to 60 percent.

Reaction--Moderately alkaline to very strongly alkaline.

**A horizons:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Other features--Thin horizon (3 inches thick) of gravelly sandy loam or sandy clay loam may be present in some pedons.

**Bk and C horizons:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Texture--(less than 2 millimeters) Stratified sand, loamy sand, coarse sand and a subhorizon of light sandy loam is present. Averages loamy coarse sand or coarse sand, or loamy sand.

Rock fragments--Average 35 to 60 percent mostly gravel, any strata may have up to 80 percent rock fragments with 40 percent cobbles and stones.

Salinity--4 to 8 millimhos/centimeters.

Structure--Massive, single grained or weak subangular blocky.

Consistence--Soft or slightly hard dry, very friable moist or is loose, nonsticky or slightly sticky, nonplastic or slightly plastic.

Other features--Horizons are stratified. Lime occurs as pendants in one or more horizons in most pedons. Lime coated gravels are present in some horizons in some pedons.

**Handpah Series**

The Handpah series consists of shallow over an indurated duripan, well drained soils that formed in mixed alluvium from dominantly volcanic rock sources. Handpah soils are on fan piedmonts. Slopes are 2 to 8 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Handpah gravelly fine sandy loam, in map unit 1332, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent pebbles.

A--0 to 6 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, slightly sticky and nonplastic; few fine roots; many very fine and fine vesicular pores; 15 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary.

Bt1--6 to 8 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium prismatic parting to moderate medium subangular blocky structure; hard, friable, sticky and plastic; common fine roots; common fine tubular pores; 5 percent pebbles; common thin clay films lining pores and faces of peds; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bt2--8 to 13 inches; yellowish brown (10YR 5/4) gravelly clay, brown (10YR 4/3) moist; weak medium prismatic structure; hard, friable, sticky and plastic; common fine roots; common fine tubular pores; 15 percent pebbles; common thick clay films lining pores and faces of peds and coating rock fragments; moderately alkaline (pH 8.4); clear smooth boundary.

Bt3--13 to 17 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few fine roots; few fine tubular pores; 30 percent pebbles; common moderately thick clay films lining pores and faces of peds; strongly alkaline (pH 8.6); clear wavy boundary.

Bqk--17 to 19 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine roots; 45 percent pebbles, mostly lime and silica cemented fragments; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

Bqkm1--19 to 22 inches; indurated duripan; massive; very hard, brittle; very strongly cemented with thick indurated lamella; violently effervescent; strongly alkaline (pH 8.6).

Bqkm2--22 to 60 inches; continuous strongly cemented duripan; massive; very hard, brittle; violently effervescent.

**Type location:** Nye County, Nevada; Stone Cabin Valley, about 2,200 feet north and 1,800 feet east of the southwest corner of Section 1, T. 3 N., R. 47 E. (38 degrees, 08 minutes, 16 seconds north latitude; 116 degrees, 40 minutes, 08 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Moist in winter and spring, mostly dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 54 degrees F.

*Depth to hardpan:* 14 to 20 inches.

**Control section:**

Clay content--Averages 25 to 35 percent.

Rock fragments--Averages 15 to 30 percent.

**A horizon:**

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Reaction--Mildly alkaline or moderately alkaline.

Carbonates--Noneffervescent to slightly effervescent.

**Bt horizons:**

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 or 4.

Reaction--Mildly alkaline or strongly alkaline.

Carbonates--Noneffervescent to slightly effervescent, some pedons may be strongly effervescent in lower part.

Texture--Averages loam, clay loam, or sandy clay loam, but some pedons have thin clay loam or clay layers.

Structure--Prismatic or subangular blocky.

Consistence--Slightly hard or hard, slightly sticky or sticky and slightly plastic or plastic.

**Bqkm horizons:**

Cementation--Some pedons have weakly cemented layers within the strongly cemented subhorizon.

Other features--The duripan is fractured in some pedons.

**Hawsley Series**

The Hawsley series consists of very deep, somewhat excessively drained soils that formed in alluvium and water reworked eolian deposits from mixed rocks. Hawsley soils are on sand sheets. Slopes are 2 to 15 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is 52 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Hawsley loamy sand, in map unit 2110, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 4 inches; light brownish gray (10YR 6/2) loamy sand, dark grayish brown (10YR 4/2) moist; weak coarse platy structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots;

common very fine and fine interstitial pores; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C--4 to 15 inches; light brownish gray (10YR 6/2) finely stratified fine sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, fine and medium roots; common very fine and fine interstitial pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Ck1--15 to 33 inches; light brownish gray (10YR 6/2) finely stratified sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; common very fine and fine interstitial pores; 5 percent pebbles; few soft lime masses; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Ck2--33 to 43 inches; light brownish gray (10YR 6/2) finely stratified sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; common very fine and fine interstitial pores; 10 percent pebbles; few soft lime masses; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Ck3--43 to 55 inches; pale brown (10YR 6/3) finely stratified coarse sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine and fine interstitial pores; 10 percent pebbles; few soft lime masses; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Ck4--55 to 60 inches; light gray (10YR 7/2) sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine and fine interstitial pores; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0).

**Type location:** 1,200 feet east and 2,300 feet south of the northwest corner of section 23, T. 12 N., R. 34 E. (38 degrees, 53 minutes, 31 seconds north latitude; 118 degrees, 07 minutes, 33 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist for short periods during winter and spring.

*Soil temperature:* 53 to 57 degrees F.

**Control section:**

Rock fragments--0 to 15 percent pebbles.

**A horizon:**

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

**C and Ck horizons:**

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Texture--Stratified fine sand through coarse sand.

Mixed texture is commonly sand but is fine sand in some pedons. Some pedons contain thin strata of loamy fine sand.

Structure--Single grain or massive.

Consistence--Loose or soft and very friable.

Reaction--Moderately alkaline or strongly alkaline, but is mildly alkaline in the upper part in some pedons.

Effervescence--Some subhorizons are slightly effervescent to violently effervescent.

Other features--Some pedons have strata with relict iron oxide stains with hue of 7.5YR.

**Hollywell Series**

The Hollywell series consists of very deep, well drained soils that formed in alluvium from mixed extrusive igneous rocks. Hollywell soils are on fan piedmonts and fan skirts. Slopes are 2 to 15 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Hollywell gravelly loamy sand, in map unit 1147 rangeland. (Colors are for dry soils unless otherwise noted.) The surface is covered with 40 percent pebbles.

A--0 to 5 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; common fine vesicular pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bw--5 to 11 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common fine tubular pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bqk--11 to 33 inches; pale brown (10YR 6/3) stratified very gravelly sandy loam to gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common fine tubular and common fine interstitial pores; few fine lime and silica coats on underside of rock fragments; 50 percent pebbles, violently effervescent; strongly alkaline (pH 8.8) clear smooth boundary.

C--33 to 60 inches; pale brown (10YR 6/3) stratified very gravelly sandy loam to very gravelly coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many fine interstitial pores; 50 percent pebbles, 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** 200 feet south and 400 feet west of the northeast corner of section 2, T. 1 N., R. 43 E. (37 degrees, 58 minutes, 28 seconds north latitude; 117 degrees, 06 minutes, 47 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring; and for 10 to 20 days cumulative during July through September following severe convection storms .

**Soil temperature:** 53 to 59 degrees F.

**Depth to base of Bw:** 10 to 20 inches.

**Reaction:** Moderately alkaline to strongly alkaline.

**Control section:**

Clay content--6 to 12 percent.

Rock fragments--Averages 35 to 60 percent

**A horizon:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4 dry or moist.

Effervescence--Noneffervescent or slightly effervescent.

**Bw horizon:**

Value--5 or 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Texture--Sandy loam or fine sandy loam.

Rock fragments--5 to 50 percent pebbles, 0 to 5 percent cobbles.

Structure--Weak medium and coarse subangular blocky.

Effervescence--Noneffervescent to slightly effervescent.

**Bqk and C horizons:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4 moist or dry.

Texture--Stratified sandy loam to coarse sand.

Rock fragments--Averages 35 to 60 percent pebbles, 0 to 15 percent cobbles.

Effervescence--Strongly effervescent to violently effervescent.

**Hooplite Series**

The Hooplite series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from rhyolitic rocks. Hooplite soils are on hills. Slopes range from 15 to 50 percent. The mean

annual precipitation is about 9 inches and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Hooplite very gravelly loam, in map unit 1792, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 60 percent pebbles and 10 percent cobbles.

A--0 to 2 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine through medium vesicular pores; 35 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.2); abrupt wavy boundary.

Btk1--2 to 4 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many fine interstitial pores; 45 percent pebbles; few thin clay films in pores; common strongly effervescent thin lime coatings on undersides of rock fragments; slightly effervescent matrix; moderately alkaline (pH 8.2); abrupt smooth boundary.

Btk2--4 to 8 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; common very fine and fine interstitial and tubular pores; few thin clay films on faces of peds and lining pores; 50 percent pebbles; common thin lime coatings on undersides of rock fragments; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

R--8 inches; hard fractured rhyolitic tuff.

**Type location:** 500 feet west and 1,100 feet north of the southeast corner of section 5, T. 15 N., R. 48 E. (39 degrees, 09 minutes, 40 seconds north latitude; 116 degrees, 35 minutes, 09 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist during winter and early spring, dry mid-June through October.

*Soil temperature:* 47 to 52 degrees F.

*Depth to hard bedrock:* 6 to 14 inches.

*Reaction:* Mildly alkaline or moderately alkaline.

*Other features:* Some pedons have up to 3 inches of highly fractured bedrock overlying the lithic contact.

*Control section:*

Clay content--18 to 25 percent, when mixed.

Rock fragments--35 to 50 percent pebbles, 0 to 10 percent cobbles.

#### A horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Carbonates--Noneffervescent or slightly effervescent.

#### Btk horizons:

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Very gravelly loam, very gravelly clay loam.

Rock fragments--35 to 50 percent.

Structure--Subangular blocky or granular.

Carbonates--Slightly effervescent or strongly effervescent.

Consistence--Soft to slightly hard dry very friable to friable, slightly sticky to sticky, slightly plastic to plastic.

## Isolde Series

The Isolde series consists of very deep, excessively drained soils that formed in eolian sand from mixed rock sources. Isolde soils are on semi-stabilized dunes. Slopes are 2 to 15 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 52 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Isolde fine sand, in map unit 1360, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 1 inch; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

C1--1 to 60 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; many very fine and fine, few medium roots; many very fine interstitial pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**Type location:** 2,600 feet north and 1,200 feet west of the southeast corner of section 6, T. 12 N., R. 34 E. (38 degrees, 56 minutes, 06 seconds north latitude; 118 degrees, 11 minutes, 13 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist for short periods in winter and spring, dry from summer to mid fall.

*Soil temperature:* 53 to 57 degrees F.

*Control section:*

Texture--Commonly fine sand or in some pedons sand, with 50 to 80 percent passing number 40 sieve and 1 to 10 percent passing the number 200 sieve.

Reaction--Neutral to moderately alkaline.

**A horizon:**

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 or 3.

**C horizon:**

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Other features--Some pedons have a 2C horizon below 40 inches. In some pedons the lower C horizon is moderately to strongly alkaline and noneffervescent to strongly effervescent.

## Itme Series

The Itme series consists of very deep, excessively drained soils that formed in alluvium from dominantly granitic or welded tuff rock sources. Itme soils are on fan piedmonts and alluvial fans. Slopes are 2 to 8 percent. Mean annual precipitation is about 6 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Itme gravelly loamy sand, in map unit 2140 rangeland. (Colors are for dry soil unless otherwise indicated.) The surface is covered with 50 percent fine pebbles.

A--0 to 4 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 30 percent pebbles; moderately alkaline (pH 8.4); smooth boundary.

C1--4 to 12 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine, and common medium roots; many very fine and fine interstitial pores; 40 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Ck--12 to 60 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; many very fine and fine interstitial pores; 45 percent pebbles, 5 percent cobbles; lime pendants on lower surface of pebbles; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** 400 feet south and 1,200 feet east of the northwest corner of section 4, T. 2 N., R. 43 E. (38 degrees, 03 minutes, 45 seconds north latitude; 117 degrees, 09 minutes, 43 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and from 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Soil reaction:** Mildly alkaline to strongly alkaline.

**Control section:**

Clay content--0 to 8 percent.

Rock fragments--35 to 60 percent, mostly pebbles with more than 50 percent of the rock fragments 2 to 5 millimeters.

**A horizon:**

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 through 3.

Carbonates--Noneffervescent or slightly effervescent.

**C and Ck horizons:**

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture (less than 2 millimeters)--Loamy sand or sand.

Structure--Massive or single grained

Consistence--Soft or slightly hard, dry, very friable or friable moist.

Carbonates--Slightly effervescent to violently effervescent.

## Izo Series

The Izo series consists of very deep, excessively drained soils that formed in alluvium from mixed igneous and sedimentary rock. Izo soils are on channels, drainages, and inset fans. Slopes are 0 to 15 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Izo very gravelly sand, in map unit 1820, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 50 percent pebbles.

A--0 to 5 inches; pale brown (10YR 6/3) very gravelly sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 35

- percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.
- C1--5 to 12 inches; pale brown (10YR 6/3) thinly stratified gravelly loamy coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; many very fine and fine interstitial pores; 30 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.
- C2--12 to 25 inches; pale brown (10YR 6/3) thinly stratified very gravelly loamy coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium roots; many very fine and fine interstitial pores; 35 percent pebbles; 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- C3--25 to 60 inches; pale brown (10YR 6/3) stratified gravelly loamy sand to extremely gravelly coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium roots; many coarse interstitial pores; 50 percent pebbles; 15 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** 2,000 feet east and 500 feet north of the southwest corner of section 20, T. 3 N., R. 48 E. (38 degrees, 05 minutes, 17 seconds north latitude; 116 degrees, 31 minutes, 15 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods in winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Organic matter:** Becomes less than 0.2 percent within 20 inches.

Reaction--Moderately alkaline or strongly alkaline, commonly increasing with depth.

**Carbonates:** Slightly effervescent or strongly effervescent. Individual thin strata are noncalcareous in some pedons.

#### Control section:

Rock fragments--Averages 50 to 75 percent, mainly pebbles.

#### A horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

#### C horizons:

Hue--2.5Y or 10YR.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Structure--Massive or single grained.

Consistence--Loose or soft, loose or very friable.

Texture--(less than 2 millimeter fraction)--Stratified coarse sand, sand, loamy sand, loamy coarse sand.

Rock fragments--50 to 75 percent, predominantly pebbles. Individual strata range from 15 to 85 percent rock fragments.

Segregated lime--Some pedons have up to 50 percent of the undersides of rock fragments in any subhorizon covered with thin lime coats.

## Jevets Series

The Jevets series consists of moderately deep to a duripan, well drained soils that formed in mixed alluvium modified with eolian sands. Jevets soils are on fan piedmonts. Slopes are 2 to 15 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Typic Durorthids

**Typical pedon:** Jevets fine sand, in map unit 1390, rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 1 inch; light brownish gray (10YR 6/2) fine sand, dark grayish brown (10YR 4/2) moist; single grained; loose, nonsticky and nonplastic; few fine roots; common fine interstitial pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

A2--1 to 5 inches; very pale brown (10YR 7/3) loamy fine sand, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; common fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

Bw--5 to 23 inches; very pale brown (10YR 7/3) loamy fine sand, brown (10YR 4/3) moist; weak fine to medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; common fine tubular pores; 5 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

Bqk--23 to 27 inches; very pale brown (10YR 7/4) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and medium roots; common fine tubular pores; 5 percent pebbles; discontinuous weakly silica and lime cemented; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bqkm--27 to 40 inches; white (10YR 8/1) indurated duripan, pale brown (10YR 6/3) moist; massive; very hard; violently effervescent.

**Type location:** About 1,000 feet south and 2,200 feet east of the northwest corner of section 19, T. 2 N., R. 47 E. (38 degrees, 0 minutes, 48 seconds north latitude; 116 degrees, 45 minutes, 29 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist when not frozen in winter and early spring, and for 10 to 20 days in the upper part during July to September following convectional storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to duripan:* 20 to 40 inches.

Reaction--Moderately alkaline to strongly alkaline.

*Control section:*

Clay content--Averages less than 8 percent.

Rock fragments--Less than 15 percent.

**A horizon:**

Value--6 or 7 dry, 4 moist.

Chroma--2 or 3 dry and moist.

**Bw horizon:**

Value--6 or 7 dry, 4 moist.

Chroma--2 through 4 dry, 3 or 4 moist.

Structure--Weak fine and medium subangular blocky or massive.

Texture--Loamy fine sand or fine sand.

Rock fragments--0 to 15 percent mainly pebbles.

**Bqk horizon:**

Silica cementation--Discontinuous weakly cemented with some discontinuous strongly cemented laminae.

Value--6 or 7 dry.

Chroma--2 through 4.

**Bqkm horizon:**

Silica cementation--Many thin continuous indurated laminae.

## Jung Series

The Jung series consists of shallow, well drained soils that formed in residuum from metavolcanic and volcanic rocks. The Jung soils are on mountain and hill crests and side slopes. Slopes are 15 to 50 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Clayey-skeletal, montmorillonitic, mesic Lithic Xerollic Haplargids

**Typical pedon:** Jung very gravelly loam, in map unit 1162, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is partially covered by 40 percent pebbles and 5 percent cobbles.

A1--0 to 3 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky, slightly plastic; few very fine and fine roots; many very fine and fine interstitial pores; 35 percent pebbles and 5 percent cobbles; noneffervescent; mildly alkaline (pH 7.6); clear smooth boundary.

A2--3 to 8 inches; light brownish gray (10YR 6/2) stony loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, very friable, slightly sticky, slightly plastic; common medium and fine roots; few fine tubular, many very fine and fine interstitial pores; 20 percent pebbles, 5 percent cobbles and 5 percent stones; noneffervescent; mildly alkaline (pH 7.6); clear smooth boundary.

Bt--8 to 14 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse subangular blocky structure; hard, friable, sticky, plastic; common medium and fine roots; common medium and fine tubular pores; many moderately thick clay films lining faces of peds and pores; 40 percent pebbles and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 7.9); clear wavy boundary.

Btk--14 to 17 inches; pale brown (10YR 6/3) very gravelly clay loam brown (10YR 5/3) moist, weak medium subangular blocky, slightly hard, very friable, slightly sticky, slightly plastic common fine and medium roots, common medium tubular pores, many moderately thick clay films on faces of peds and on pores, 40 percent pebbles; 10 percent cobbles; lime coating on underside of rock fragments; strongly effervescent, moderately alkaline (pH 7.9) abrupt wavy boundary. (3 to 5 inches thick.)

R--17 inches; hard rhyolite bedrock.

**Type location:** 1,900 feet south and 600 feet east of the northwest corner of section 13, T. 14 N., R. 37 E. (39 degrees, 04 minutes, 48 seconds north latitude; 117 degrees, 46 minutes, 26 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist winter and spring, dry mid-June through early November.

*Soil temperature:* 47 to 52 degrees F.

*Depth to bedrock:* 14 to 20 inches.

*Control section:*

Clay content--35 to 45 percent.

Rock fragments--35 to 50 percent, mainly pebbles and cobbles.

**A horizons:**

Value--3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

**Bt horizon:**

Hue--10YR or 7.5YR.  
 Value--5 or 6 dry, 4 or 5 moist.  
 Chroma--3 or 4.  
 Texture--Very gravelly clay loam, very cobbly clay loam, and very cobbly clay.  
 Structure--Subangular blocky, prismatic or angular blocky structure.  
 Reaction--Moderately alkaline or strongly alkaline.

**Btk horizon:**

Carbonates--Slightly effervescent or strongly effervescent.

**Kawich Series**

The Kawich series consists of deep and very deep, excessively drained soils that formed in eolian sand from mixed rocks. Kawich soils are on stabilized dunes. Slopes are 0 to 30 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Kawich fine sand, in map unit 1495, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 3 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grained; loose; few very fine roots; many very fine and fine interstitial pores; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C1--3 to 19 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grained; loose; common very fine and fine roots; many very fine and fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (6 to 60 inches)

C2--19 to 60 inches; pale brown (10YR 6/3) fine sand, brown (10YR 4/3) moist; single grained; loose; few fine roots; many very fine and fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

**Type location:** 500 feet west and 130 feet south of the northeast corner of section 7, T. 11 N., R. 36 E. (38 degrees, 50 minutes, 04 seconds north latitude; 117 degrees, 57 minutes, 52 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, but moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 54 to 59 degrees F.

**Depth to lake sediments:** 40 to over 120 inches.

**Control section:**

Texture--Averages fine sand, but may contain strata of sand or loamy fine sand.

**A horizon:**

Hue--10YR or 7.5YR.  
 Value--5 through 8 dry, 4 through 7 moist.  
 Chroma--1 through 4.

**C horizons:**

Consistence--Hard or loose dry, very friable or loose moist.

Structure--Massive, single grained.

Carbonates--Slightly effervescent to violently effervescent.

Soil reaction--Mildly alkaline to very strongly alkaline.

Other features--Contains significant amounts of pyroclastic material.

**Keefa Series**

The Keefa series consists of very deep, well drained soils that formed in mixed alluvium. Keefa soils are on inset fans and fan skirts. Slopes are 0 to 4 percent. Mean annual precipitation is about 6 inches and mean annual temperature is about 54 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Duric Camborthids

**Typical pedon:** Keefa sandy loam, in map unit 1741, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 4 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; few very fine and fine vesicular pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bw--4 to 13 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine to medium tubular pores; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bk--13 to 25 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine to medium roots; many very fine to medium tubular pores; 20 percent pebbles; common thin lime pendants on rock fragments; few lime filaments; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

**Bqk**--25 to 54 inches; pale brown (10YR 6/3) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, brittle; common very fine and fine roots; common very fine and fine tubular pores; 15 percent pebbles; continuous brittle matrix; common silica-lime filaments and pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

**C**--54 to 60 inches; light yellowish brown (10YR 6/4) stratified very gravelly sand to gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine to medium roots; many very fine to coarse interstitial pores; 30 percent pebbles; discontinuous lenses of weakly or strongly silica-lime cementation; strongly effervescent; moderately alkaline (pH 8.0).

**Type location:** 1,000 feet west and 600 feet south of the northeast corner of section 26, T. 3 N., R. 44 E. (38 degrees, 05 minutes, 30 seconds north latitude; 117 degrees, 00 minutes, 14 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days, cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to silica accumulations:** 20 to 36 inches.

**Reaction:** Strongly effervescent or violently effervescent in all parts. A and Bw horizons are affected by recharge of carbonates as dust.

#### Control section:

Clay content--8 to 15 percent.

Rock fragments--10 to 25 percent.

#### A horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

#### Bw horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 through 6.

Texture--Sandy loam or coarse sandy loam.

Rock fragments--0 to 25 percent, one-half or more are less than 5 millimeter in diameter.

Structure--Moderate or strong, subangular blocky.

Consistence--Very friable or friable, nonsticky or slightly sticky, nonplastic or slightly plastic

Reaction--Moderately alkaline or strongly alkaline.

#### Bk horizon:

Value--6 through 8 dry, 4 or 5 moist.

Chroma--2 through 6.

Texture--Sandy loam or coarse sandy loam.

Rock fragments--0 to 30 percent, one-half or more are less than 5 millimeter in diameter.

Structure--Massive or subangular blocky.

Consistence--Soft or slightly hard, nonsticky or slightly sticky, nonplastic to slightly plastic.  
Reaction--Moderately alkaline or strongly alkaline.

#### Bqk horizon:

Value--5 through 7 dry, 4 or 5 moist.

Chroma--3 through 6.

Texture--Sandy loam, coarse sandy loam; subhorizons of loamy sand are in some pedons.

Rock fragments--15 to 35 percent, one-half or more are less than 5 millimeter in diameter.

Consistence--Hard, firm and brittle due to accumulation of silica and lime.

Reaction--Strongly alkaline or very strongly alkaline.

Other features--Discontinuous lenses of weakly or strongly silica-lime cemented material are in some pedons.

#### C horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 through 6.

Texture--Sandy loam to loamy coarse sand.

Rock fragments--15 to 35 percent.

Reaction--Moderately alkaline or strongly alkaline.

## Kelk Series

The Kelk series consists of very deep, well drained soils that formed in loess with some influence from volcanic ash and mixed silty alluvium derived mainly from mixed rock sources. The Kelk soils are on stream terraces and alluvial plains. Slopes are 0 to 4 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is 48 degrees F.

**Taxonomic class:** Fine-silty, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Kelk silt loam, in map unit 2320, rangeland. (Colors are for dry soil unless otherwise noted.)

**A1**--0 to 3 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary.

**A2**--3 to 6 inches; brown (10YR 5/3) very fine sandy loam, dark brown (10YR 3/3) moist; moderate thin platy structure parting to moderate fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common fine tubular and many fine interstitial pores; moderately alkaline (pH 8.2); gradual smooth boundary.

**Bw1**--6 to 12 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; strong fine and medium subangular blocky structure; slightly hard,

friable, slightly sticky and slightly plastic; common very fine through medium roots; common very fine and fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bw2--12 to 21 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine through medium roots; common very fine and fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bqk1--21 to 42 inches; light gray (10YR 7/2) silt loam, dark brown (10YR 3/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine roots; common very fine and fine tubular pores; 30 percent, 10 to 25 millimeter strong durinodes, fractured weak silica cementation that is brittle; common fine lime filaments; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.

Bqk2--42 to 60 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive, soft, very friable, slightly sticky and slightly plastic; few very fine tubular pores; lenses of 15 percent pebbles; few lenses of discontinuous weak silica cementation; many fine secondary carbonates in filaments; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** 50 feet north and 500 feet east of the southwest corner of section 14, T. 11 N., R. 46 E. (36 degrees, 47 minutes, 10 seconds north latitude; 116 degrees, 46 minutes, 17 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring, dry from early June through October.

*Soil temperature:* 47 to 52 degrees F.

*Depth to base of Bw horizon:* 10 to 35 inches.

*Depth to brittle matrix:* 12 to 35 inches.

*Depth to carbonates:* 12 to 35 inches.

Other features--These soils are normally slightly or moderately salt affected below 24 to 48 inches. Bk horizons are below 40 inches in some pedons.

#### Control section:

Clay content--18 to 27 percent.

#### A horizons:

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

Effervescence--Noneffervescent or slightly effervescent.

#### Bw horizons:

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 or 3.

Structure--Blocky, prismatic or it is massive.

Consistence--Very friable or friable, moist; slightly sticky or sticky and slightly plastic or plastic, wet.

Reaction--Neutral to moderately alkaline. It is strongly alkaline when affected by salts and sodium.

Effervescence--Noneffervescent or slightly effervescent.

Other features--There are 10 to 20 percent weak durinodes near the lower horizon boundary in some pedons.

#### Bqk horizons:

Value--6 through 8 dry, 3 through 6 moist.

Chroma--2 through 4.

Texture--Dominantly silt loam with thin strata of silty clay loam common in some pedons below 30 inches.

Structure--Moderate fine and medium subangular blocky or massive.

Consistence--Slightly hard to hard dry, very friable to firm and brittle, moist; slightly sticky or sticky and slightly plastic to plastic, wet.

Reaction--Neutral through strongly alkaline, increasing with depth.

Effervescence--Slightly effervescent through violently effervescent in the Bqk horizon.

Cementation--Subhorizons without continuously brittle matrix contains 30 to 90 percent durinodes or are 20 to 50 percent discontinuous weakly silica cemented.

Other features--Some pedons lack relict mottles in the lower part of the Bqk horizons. Some pedons have lenses of 5 to 15 percent pebbles in some Bqk subhorizon or extremely gravelly substrata below 42 inches. Some pedons have silty clay loam 2Bk horizons below 39 inches.

## Koyen Series

The Koyen series consists of very deep, well drained soils that formed in mixed alluvium derived dominantly from volcanic rocks. Koyen soils are on fan piedmonts, fan skirts and alluvial flats. Slopes are 0 to 8 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is approximately 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Typic Camborthids

**Typical pedon:** Koyen gravelly sandy loam, in map unit 1751, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 20 percent pebbles.

A--0 to 4 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 15 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bw1--4 to 15 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; few fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary. (0 to 12 inches)

Bw2--15 to 21 inches; pale brown (10YR 6/3) sandy loam with thin strata of loamy sand in the lower portion, brown (10YR 4/3) moist; weak medium subangular blocky; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; few fine tubular pores; 10 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bk--21 to 27 inches; pale brown (10YR 6/3) sandy loam with thin strata of loamy sand in lower portion, brown (10YR 4/3) moist; massive; soft with very friable, nonsticky and nonplastic; common very fine and fine roots; few fine tubular pores; 10 percent pebbles; few soft lime masses; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

2C--27 to 60 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; few fine tubular pores; 15 percent pebbles; strongly effervescent; strongly alkaline (pH 8.5).

**Type location:** 600 feet west and 500 feet south of the northeast corner of section 11, T. 4 N., R. 47 E. (38 degrees, 13 minutes, 05 seconds north latitude; 116 degrees, 40 minutes, 35 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winters and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to Bk horizon:** 14 to 21 inches.

**Reaction:** Moderately alkaline or strongly alkaline, being mostly alkaline in the Bk horizon.

#### Control section:

Clay content--10 to 18 percent.

Rock fragments--Average 10 to 25 percent but any one horizon can contain up to 40 percent pebbles.

#### A horizon:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

#### Bw horizons:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Structure--Appears massive but parts to very weak or weak fine medium or coarse subangular blocky.

Texture--Sandy loam, some pedons have strata of fine sandy loam, loam, or loamy sand.

Carbonates--Noneffervescent except in lower part.

#### Bk horizon:

Value--6 through 8 dry, 4 through 6 moist.

Chroma--2 through 4.

Carbonates--Strongly effervescent or violently effervescent.

Structure--Subangular blocky or massive.

Texture--Sandy loam with some pedons having strata of fine sandy loam, loam, or loamy sand.

Consistence--Soft to hard, very friable to firm.

#### 2C horizon:

Value--6 or 7 dry, 4 through 6 moist.

Chroma--2 or 3.

Consistence--Soft or slightly hard.

Texture--Gravelly loamy sand, loamy sand or sand

## Kyler Series

The Kyler series consists of shallow and very shallow, well drained soils formed in residuum and colluvium from limestone and dolomite. Kyler soils are on mountain slopes, and hills. Slopes are 8 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

**Typical pedon:** Kyler very gravelly fine sandy loam, the adjacent 1580, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 50 percent pebbles and 10 percent cobbles.

A1--0 to 1 inch; light brownish gray (10YR 6/2) very gravelly fine sandy loam, dark grayish brown (10YR 4/2) moist; weak moderately thick platy; soft, very friable, nonsticky and nonplastic; few fine roots; common fine tubular pores; 45 percent pebbles; 10 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2--1 to 3 inches; pale brown (10YR 6/3) very cobbly sandy loam, brown (10YR 4/3) moist; weak thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine vesicular pores; 10 percent pebbles, 25 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C--3 to 9 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; 40 percent pebbles, 15 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

R--9 inches; hard bedrock; violently effervescent.

**Type location:** 400 feet north and 1,800 feet west of the southwest corner of section 32, T. 3 N., R. 47 E. (38 degrees, 03 minutes, 36 seconds north latitude; 116 degrees, 44 minutes, 07 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring months, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to bedrock:* 6 to 14 inches.

*Reaction:* Moderately alkaline or very strongly alkaline.

*Effervescence:* Strongly effervescent to violently effervescent.

*Carbonates:* 40 to 60 percent calcium carbonate equivalent.

*Control section:*

Clay content--7 to 18 percent.

Rock fragments--35 to 60 percent.

#### A horizon:

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 or 3.

#### C horizon:

Hue--10YR or 7.5YR.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4 moist.

Texture (less than 2mm fraction)--Loam, including strata of fine sandy loam, very fine sandy loam or silt loam.

Structure--Massive or subangular blocky.

Consistence--Soft or slightly hard dry, very friable to friable moist, slightly sticky or sticky, slightly plastic or plastic.

Rock fragments--Average 35 to 60 percent.

Subhorizons have up to 70 percent rock fragments in some pedons.

Other features--Some pedons have a thin Bk horizon. Some pedons have thin lime coats on rock fragments.

The mean annual precipitation is about 6 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-loamy over sandy or sandy-skeletal, mixed, mesic Duric Haplargids

**Typical pedon:** Lathrop very stony fine sandy loam, in the adjacent Esmeralda County Area, Nevada map unit 270, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 5 percent stones, 10 percent cobbles, and 30 percent pebbles.

A--0 to 5 inches; pale brown (10YR 6/3) very stony fine sandy loam, brown (10YR 4/3) moist; strong thick platy structure; soft, very friable, nonsticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 30 percent pebbles, 10 percent cobbles and 5 percent stones; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

Bt--5 to 9 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to strong medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few medium roots; many very fine tubular pores; few thin clay films coating faces of peds and common thin clay films lining pores; 30 percent pebbles; mildly alkaline (pH 7.4); clear wavy boundary.

Btk--9 to 11 inches; yellowish brown (10YR 5/4) gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine tubular pores; few thin clay films lining pores and coating faces of peds; 30 percent pebbles; common thin lime coatings on faces of peds and lining pores; slightly effervescent; moderately alkaline (pH 7.9); abrupt wavy boundary.

2Bqk1--11 to 19 inches; light yellowish brown (10YR 6/4) very gravelly loamy coarse sand, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; common very fine roots; many very fine tubular pores; 45 percent pebbles and 10 percent cobbles; many thick lime and silica pendants coating rock fragments; fine earth fraction is 40 percent weakly silica and lime cemented with some strongly cemented masses; violently effervescent; continuous brittle matrix; strongly alkaline (pH 8.8); clear wavy boundary.

2Bqk2--19 to 30 inches; light yellowish brown (10YR 6/4) very gravelly coarse sand, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; common very fine, fine, and medium roots; many very fine and fine interstitial pores; 40 percent pebbles and 10 percent cobbles; many thin to thick lime and silica pendants coating rock

## Lathrop Series

The Lathrop series consists of very deep, well drained soils that formed in alluvium from mixed rocks. Lathrop soils are on fan piedmonts. Slopes are 4 to 15 percent.

fragments; fine earth fraction is 20 percent weakly silica and lime cemented with some strongly cemented masses; strongly effervescent; continuous brittle matrix; strongly alkaline (pH 8.8); clear wavy boundary.

2Bqk3--30 to 60 inches; very pale brown (10YR 7/4) extremely gravelly coarse sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine and fine interstitial pores; 50 percent pebbles, 15 percent cobbles, 5 percent stones; lime and silica pendants common on rock fragments; 10 percent weakly and strongly cemented lenses; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** 1,200 feet south and 1,300 feet east of the northwest corner of section 11, T. 2 N. R. 42 E. (38 degrees, 02 minutes, 48 seconds north latitude; 117 degrees, 14 minutes, 08 seconds west longitude.) South of Mount Butler in the Esmeralda County Area, Nevada.

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to the 2B horizon:* 10 to 27 inches.

**Control section:**

Clay content--20 to 30 percent in the upper part and 0 to 5 percent in the lower part.

Rock fragments--10 to 30 percent in the upper part and 50 to 90 percent in the lower part.

**A horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Reaction--Moderately alkaline or strongly alkaline.

Carbonates--Slightly effervescent to violently effervescent.

**Bt and Btk horizon:**

Hue--10YR or 7.5YR.

Value--5 through 7 dry; 4 or 5 moist.

Chroma--2 through 4.

Texture (less than 2 millimeter)--Clay loam, sandy clay loam or loam.

Clay content--20 to 30 percent.

Rock fragments--10 to 30 percent, dominantly pebbles.

Reaction--Mildly alkaline to strongly alkaline.

Carbonates--Lime is present in thin filaments or masses in some pedons.

Structure--Prismatic, massive, or subangular blocky.

**2Bqk horizons:**

Value--6 through 8 dry, 5 through 7 moist.

Chroma--2 through 4.

Texture (less than 2 millimeter)--Loamy sand, loamy coarse sand, sand, coarse sand.

Rock fragments--50 to 90 percent dominantly pebbles and 10 to 50 percent cobbles.

Reaction--Moderately alkaline to very strongly alkaline.

Carbonates--Strongly effervescent to violently effervescent.

Consistence--Hard or very hard dry; firm or very firm moist.

Durinodes--Soils with friable matrix contain 20 to 40 percent durinodes with weak silica and lime cementation.

## Leo Series

The Leo series consists of very deep, excessively drained soils that formed in alluvium from mixed rocks. Leo soils are on alluvial fans, fan piedmonts and fan skirts. Slopes are 2 to 15 percent. The mean annual precipitation is about 8 inches. The mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Leo gravelly sandy loam, in map unit 1705, rangeland. (Colors are for dry soils unless otherwise indicated.) The surface is covered with 30 percent pebbles.

A--0 to 6 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine and fine vesicular pores; 25 percent pebbles; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

C1--6 to 19 inches; pale brown (10YR 6/3) extremely gravelly coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; few very fine and fine tubular, and many and very fine interstitial pores; 65 percent pebbles; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

C2--19 to 36 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few medium, and many very fine and fine roots; many very fine and fine interstitial pores; 40 percent pebbles, 15 percent cobbles; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

C3--36 to 60 inches; light brownish gray (10YR 6/2) stratified extremely gravelly coarse sand to gravelly fine sandy loam, brown (10YR 4/3) moist; massive to single grain; soft and loose, very friable and

loose; nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 35 percent pebbles, 10 percent cobbles and 5 percent stones; slightly effervescent; moderately alkaline (pH 8.0).

**Type location:** 1,100 feet south and 2,400 feet west of the northeast corner of section 1, T. 3 N., R. 43 E. (38 degrees, 08 minutes, 50 seconds north latitude; 117 degrees, 06 minutes, 04 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Reaction:* Moderately alkaline or strongly alkaline.

*Control section:*

Clay content--0 to 5 percent.

Rock fragments--35 to 55 percent, dominantly pebbles. Individual strata range from 10 to 100 percent rock fragments in some pedons.

**A horizon:**

Value--5 through 7 dry; 4 or 5 moist.

Chroma--2 or 3.

Carbonates--Noneffervescent to strongly effervescent.

**C horizon:**

Value-- 5 through 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Texture--Stratified; includes strata of fine sandy loam or sandy loam as well as sand, loamy sand and gravel in some pedons.

Rock fragments--Average 35 to 65 percent, dominantly pebbles, with individual strata ranging from 10 to 100 percent.

Consistence--Loose or soft, loose or very friable.

Structure--Massive or single grained.

Carbonates--Slightly effervescent to strongly effervescent.

Other features--Strong influence from pyroclastic materials. Some pedons have randomly oriented silica and lime coats on rock fragments.

**Typical pedon:** Linoyer very fine sandy loam, in map unit 1970, rangeland. (Colors are for air dry soil unless otherwise noted.)

A1--0 to 2 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and few medium roots; few fine and medium tubular pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

A2--2 to 8 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine through medium roots; few fine and very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C1--8 to 19 inches; pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; few fine and medium tubular pores; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.

C2--19 to 34 inches, pale brown (10YR 6/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C3--34 to 54 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and plastic; few fine roots; few very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.

2C4--54 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common fine interstitial pores; 60 percent pebbles; strongly effervescent; strongly alkaline (pH 8.2).

**Type location:** 1,200 feet south and 100 feet west of the northeast corner of section 19, T. 9 N., R. 46 E. (38 degrees, 36 minutes, 40 seconds north latitude; 116 degrees, 54 minutes, 51 seconds west longitude.)

**Range in characteristics:**

*Soil temperature:* 47 to 54 degrees F. The mean annual summer soil temperature ranges from 66 to 70 degrees F.

*Soil moisture:* Usually dry, moist in winter and spring, dry summer and fall.

**A horizons:**

Hue--10YR or 7.5YR.

## Linoyer Series

The Linoyer series consist of very deep, well drained soils that formed in alluvium on fan skirts, inset fans, and lake plains. Slopes are 0 to 4 percent. The average annual precipitation is about 8 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Coarse-silty, mixed (calcareous), mesic Xeric Torriorthents

Value--5 through 7 dry, 4 through 6 moist.  
 Chroma--2 through 4.  
 Reaction--Moderately alkaline to strongly alkaline.  
 Structure--Platy, subangular blocky, or prismatic.  
 Consistence--Soft to slightly hard and friable to very friable.

#### C horizons:

Hue--of 10YR, 7.5YR or 5YR.  
 Value--5 through 7 dry, 4 through 6 moist.  
 Chroma--2 through 6.  
 Reaction--Moderately alkaline to strongly alkaline.  
 Texture--Very fine sandy loam or silt loam.  
 Structure--Massive or platy.  
 Consistence--Soft or slightly hard, very friable to friable and slightly plastic to plastic.

## Logring Series

The Logring series consists of shallow and very shallow, well drained soils that formed in residuum and colluvium from limestone, dolomite and other highly calcareous sedimentary rocks. Logring soils are on mountain slopes and hills. Slopes are 30 to 75 percent. Mean annual precipitation is about 12 inches and mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, carbonatic, mesic Lithic Xeric Torriorthents

**Typical pedon:** Logring very cobbly fine sandy loam, in map unit 1670, woodland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 30 percent pebbles and 25 percent cobbles.

A--0 to 3 inches; brown (10YR 5/3) very cobbly fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and fine interstitial pores; 30 percent pebbles, 20 percent cobbles; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bw--3 to 6 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine and medium, few coarse roots; common very fine and fine interstitial and tubular pores; 30 percent pebbles and 20 percent cobbles; common thin lime pendants on rock fragments; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk--6 to 10 inches; pale brown (10YR 6/3) very cobbly loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine and medium coarse roots; common very fine and fine interstitial and tubular pores; 30

percent pebbles, 20 percent cobbles; common medium lime pendants on rock fragments; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

R--10 inches; fractured limestone; lime filling fractures.

**Type location:** 2,500 feet north and 1,600 feet west of the southeast corner of section 23, T. 7 N., R. 43 E. (39 degrees, 26 minutes, 58 seconds north latitude; 117 degrees, 07 minutes, 13 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in winter and spring months, dry summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 47 to 50 degrees F.

**Reaction:** Moderately alkaline or strongly alkaline.

**Carbonates:** Strongly effervescent to violently effervescent throughout, with 40 to 60 percent calcium carbonate equivalent and 15 to 40 percent finely divided lime in upper 18 centimeters.

Accumulation of secondary carbonates is less than 5 percent in horizons more than 4 inches thick.

**Organic carbon:** 1.0 to 1.5 percent in upper 7 inches

**Depth to bedrock:** 7 to 14 inches.

**Control section:**

Clay content--8 to 18 percent.

Rock fragments--35 to 60 percent, mainly cobbles and pebbles.

#### A horizon:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 through 4.

#### Bw horizon:

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture of fine earth--Loam, fine sandy loam, or sandy loam.

#### Bk horizon:

Chroma--3 or 4.

Texture--Very cobbly loam, very cobbly fine sandy loam or extremely cobbly loam.

## Luning Series

The Luning series consists of very deep, somewhat excessively drained soils. These soils formed in alluvium from mixed sources. The Luning soils are on inset fans, alluvial fans and fan piedmonts. Slopes are 0 to 8 percent. The mean annual precipitation is about 4 inches and the mean annual temperature is about 54 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Typic Torriorthents

**Typical pedon:** Luning loamy sand, in map unit 2110, rangeland. (Colors are for dry soil unless otherwise noted.)

- A--0 to 3 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; single grained; loose, nonsticky and nonplastic; few fine roots; many fine interstitial pores; 5 percent pebbles; slightly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary.
- C1--3 to 8 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many fine interstitial pores; 25 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.
- C2--8 to 13 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine tubular pores; 20 percent pebbles; strongly effervescent; strongly alkaline (pH 8.4); clear smooth boundary.
- C3--13 to 21 inches; pale brown (10YR 6/3) finely stratified gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine tubular pores; 25 percent pebbles; strongly effervescent; strongly alkaline (pH 8.4); clear smooth boundary.
- C4--21 to 44 inches; pale brown (10YR 6/3) stratified sandy loam to very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine tubular pores; 25 percent pebbles and 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- C5--44 to 50 inches; pale brown (10YR 6/3) stratified sandy loam to very gravelly coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; common medium interstitial pores; 30 percent pebbles, 5 percent stones; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- C6--50 to 60 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** 600 feet south and 1,200 feet east of the northwest corner of section 29, T. 13 N., R. 34 E. (38 degrees, 58 minutes, 12 seconds north latitude; 118 degrees, 10 minutes, 38 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and spring and for 10 to 20 days cumulative between July to October due to convection storms. Dry in lower moisture control section.

**Soil temperature:** 53 to 59 degrees F.

**Reaction:** Mildly alkaline to strongly alkaline.

**Carbonates:** Noneffervescent to violently effervescent.

**Control section:**

Clay content--2 to 8 percent.

Rock fragments--10 to 30 (dominantly 2 to 5 millimeters) strata containing greater than 35 percent rock fragments.

Other features--Thin strata (1/2 to 2 inches) of sandy loam in some pedons, but are discontinuous and/or thin.

#### A horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

#### C horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Texture (less than 2 millimeters)--Loamy sand, sand, or coarse sand with thin strata of sandy loam.

Averages loamy sand or sand.

Carbonates--Slightly effervescent to violently effervescent.

Structure--Massive, subangular blocky or is single grain.

Consistence--Loose or soft to slightly hard dry, loose or very friable to friable, nonsticky to slightly sticky and nonplastic to slightly plastic.

## Lyda Series

The Lyda series consists of very shallow and shallow over an indurated duripan, well drained soils that formed in mixed alluvium from mainly volcanic sources. Lyda soils are on fan piedmonts. Slopes are 2 to 8 percent. The mean annual precipitation is about 5 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Durargids

**Typical pedon:** Lyda very cobbly fine sandy loam, in map unit 1805, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent pebbles and 35 percent cobbles

A1--0 to 3 inches; light brownish gray (10YR 6/2) very cobbly fine sandy loam, dark grayish brown (10YR 4/2) moist; weak moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic;

- many very fine interstitial pores; 20 percent pebbles and 25 percent cobbles; slightly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary
- A2--3 to 6 inches;** very pale brown (10YR 7/3) fine sandy loam, brown (10YR 4/3) moist; moderately thick and thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine vesicular pores; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary.
- Bt--6 to 12 inches;** light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, fine and medium roots; common very fine tubular pores; common thin clay films in pores, many thin clay films bridging sand grains and few thin clay films on faces of peds; 30 percent pebbles, 10 percent cobbles; strongly alkaline (pH 8.6); abrupt wavy boundary.
- Btk--12 to 14 inches;** pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common few fine roots; few fine tubular pores; few thin clay films in pores; 30 percent pebbles, 10 percent cobbles; common thin lime coating rock fragments; slightly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary.
- Bqkm1--14 to 16 inches;** white (10YR 8/2) indurated duripan, pale brown (10YR 6/3) massive; extremely hard, extremely firm; violently effervescent; strongly alkaline (pH 9.0)
- Bqkm2--16 to 60 inches** continuous strongly cemented duripan with pockets of extremely gravelly loamy coarse sand.
- Type location:** 800 feet south and 1,600 feet east of the northwest corner of section 19, T. 4 N., R. 44 E. (38 degrees, 11 minutes, 30 seconds north latitude; 117 degrees, 5 minutes, 15 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms

**Soil temperature:** 53 to 59 degrees F.

**Depth to duripan:** 8 to 14 inches

**Reaction:** Strongly alkaline or very strongly alkaline

**Control section:**

Clay content--25 to 35 percent

Rock fragments--35 to 50 percent total, mainly pebbles

#### A horizons:

Value--6 or 7 dry, 3 or 4 moist

Chroma--2 or 3

Carbonates--Noneffervescent to violently effervescent

#### Bt horizon:

Hue 7.5YR or 10YR

Value--5 or 6 dry, 4 or 5 moist

Chroma--2 through 4

Clay content--30 to 40 percent

Rock fragment--35 to 50 percent

Texture (less than 2 millimeters fraction)--Clay loam or sandy clay loam.

Structure--Subangular blocky or prismatic.

Consistence--Slightly hard or hard, very friable or friable, slightly plastic to very plastic.

#### Btk horizon:

Value--5 through 7 dry, 4 or 5 moist

Chroma--3 or 4

Rock fragments--40 to 60 percent

Texture (less than 2 millimeters fraction)--Sandy clay loam or sandy loam

Consistence--Soft or slightly hard, very friable or friable.

#### Bqkm horizons:

Value--5 through 8

Chroma--2 through 4

Thickness--Typically cemented for 2 to 4 feet, indurated at the upper part.

## Lyx Series

The Lyx series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium of dominantly volcanic rock sources. Lyx soils are on inset fans, alluvial fans and fan skirts. Slopes are 0 to 8 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 55 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Lyx gravelly loamy sand, in map unit 1134, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 35 percent pebbles.

**A--0 to 3 inches;** pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many fine and medium interstitial pores, few fine vesicular pores; 30 percent pebbles; moderately alkaline (pH 8.4); clear smooth boundary.

**Bw--3 to 11 inches;** pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky

structure; soft, very friable, slightly sticky and nonplastic; many very fine through medium roots; many very fine and fine interstitial pores; 40 percent pebbles; strongly alkaline (pH 8.6); clear wavy boundary.

Bk--11 to 24 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine through medium roots; many very fine and fine and common coarse interstitial pores; 40 percent pebbles; few thin lime coating undersides of rock fragments; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

2Bk--24 to 60 inches; pale brown (10YR 6/3) stratified very gravelly sandy loam through extremely gravelly coarse sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine and medium, many coarse interstitial pores; 55 percent pebbles; common fine lime coating undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.4)

**Type location:** Nye County, Nevada; Stone Cabin Valley, approximately 1,200 feet north and 400 feet east of the southwest corner of section 30, T. 3 N., R. 49 E. (38 degrees, 04 minutes, 24 seconds north latitude; 116 degrees, 32 minutes, 34 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist during winter and early spring and for 10 to 20 days cumulative between July and September due to summer convection storms.

**Soil temperature:** 55 to 59 degrees F.

**Depth to 2Bk horizon:** 11 to 28 inches.

**Carbonates:** Noneffervescent in the upper part, strongly effervescent to violently effervescent in the substratum in most pedons.

**Reaction:** Moderately alkaline or strongly alkaline.

**Control section:**

Rock fragments--Averages 35 to 55 percent pebbles, mainly of volcanic origin.

#### A horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

#### Bw horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture (less than 2 millimeter fraction)--Sandy loam or fine sandy loam

Rock fragments--25 to 45 percent.

Consistence--Nonplastic or slightly plastic wet.

#### Bk and 2Bk horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture (less than 2mm fraction)--Averages loamy sand, sand or loamy coarse sand with strata of sandy loam.

Rock fragments--Averages 35 to 60 percent, mainly gravel with less than 5 percent cobbles

Other features--The 2Bk horizon is highly stratified in most pedons.

## Maggie Series

The Maggie series consists of shallow over an indurated duripan, well drained soils that formed in volcanic residuum and colluvium. They are on hills and pediments. Slopes are 2 to 30 percent. Mean annual precipitation is 6 inches and mean annual temperature is approximately 54 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Durargids

**Typical pedon:** Maggie very gravelly loam in map unit 2080, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 50 percent pebbles and 5 percent cobbles.

A1--0 to 2 inches; light gray (10YR 7/2) very gravelly loam, brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine vesicular pores; 45 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1/2 to 3 inches thick)

A2--2 to 4 inches; very pale brown (10YR 7/3) gravelly sandy clay loam, brown (10YR 5/3) moist; strong thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine vesicular pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); very abrupt smooth boundary.

Bt--4 to 8 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine roots; many very fine interstitial pores; common thin clay films on faces of peds and in pores; 50 percent pebbles and 5 percent cobbles; moderately alkaline (pH 8.4); clear smooth boundary.

Btk--8 to 12 inches; pale brown (10YR 6/3) very gravelly sandy loam; brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and few fine and medium roots; many very fine tubular pores; few thin clay films in pores; 50 percent pebbles and 5 percent cobbles;

strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

Bqkm--12 to 22 inches; interlaminated duripan consisting of several continuous indurated 3/4 inch thick laminae and strongly and weakly silica-lime cemented strata; extremely hard, extremely firm; common very fine and fine roots matted on laminae; abrupt wavy boundary.

R--22 inches; extremely hard tuffaceous and rhyolitic bedrock.

**Type location:** 600 feet east and 1,200 feet north of the southeast corner of section 13, T. 6 N., R. 39 E. (38 degrees, 22 minutes, 39 seconds north latitude; 117 degrees, 33 minutes, 17 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist during winter and early spring and for 10 to 20 days in the upper part, July through September, following convection storms.

*Soil temperature:* 50 to 55 degrees F.

*Depth to duripan:* 10 to 18 inches.

*Depth to bedrock:* 20 to 36 inches.

*Reaction:* Moderately alkaline to very strongly alkaline throughout the soil.

#### Control section:

Clay percentage--18 to 27.

Rock fragments--40 to 60 percent, mostly pebbles

#### A horizons:

Value--6 or 7 dry, 4 or 5 moist

Chroma--2 or 3.

#### Bt horizon:

Hue--10YR or 2.5Y

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture (< 2 mm.)--Fine sandy loam, loam, sandy clay loam.

Consistence--Slightly hard to hard dry.

Clay percentage--18 to 30 percent

Rock fragments--40 to 60 percent.

#### Btk horizon:

Texture--(< 2 mm.) sandy loam, loamy sand.

Rock fragments--35 to 60 percent.

## Minnye Series

The Minnye series consists of very deep, well drained soils that formed in alluvium derived dominantly from rhyolite, andesite, and related igneous rocks. Minnye soils are on fan piedmonts and alluvial fans. Slopes are 2 to 8 percent. Mean annual precipitation is about 6 inches; the mean annual temperature is about 52 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Haplargids.

**Typical pedon:** Minnye very cobbly fine sandy loam, in map unit 1661, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent surface and 35 percent cobbles.

A--0 to 3 inches; pale brown (10YR 6/3) very cobbly fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial and common fine tubular pores; 20 percent pebbles, 30 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); abrupt wavy boundary.

Btk1--3 to 12 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; strong medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; many very fine tubular and few fine tubular pores; common thin clay films on faces of peds and lining pores; 25 percent pebbles, 25 percent cobbles; common distinct lime pendants on rock fragments; strongly effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

Btk2--12 to 20 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium and fine subangular blocky structure; soft, very friable, nonsticky and slightly plastic; common very fine and fine and few medium roots; many very fine and few fine tubular pores; few thin clay films lining pores; 50 percent pebbles, 5 percent cobbles; many distinct lime pendants on rock fragments; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

Bk1--20 to 29 inches; light yellowish brown (10YR 6/4) finely stratified extremely gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky, nonplastic; many very fine and fine and few medium roots; many very fine interstitial pores; 80 percent pebbles; 5 percent cobbles; many distinct lime pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

Bk2--29 to 50 inches; light yellowish brown (10YR 6/4) finely stratified extremely gravelly loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 60 percent pebbles, 20 percent cobbles; common distinct lime pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

Bqk--50 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine

roots; many very fine interstitial pores; 75 percent pebbles, 5 percent cobbles; few faint lime and silica pendants on rock fragments; strongly effervescent; very strongly alkaline (pH 9.2).

**Type location:** 2,200 feet north and 1,400 feet west of the southeast corner of section 20, T. 13 N., R. 37 E. (38 degrees, 58 minutes, 35 seconds north latitude; 117 degrees, 50 minutes, 15 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, but moist for short periods in winter and early spring and for 10 to 20 days during the period of July to September due to convection storms.

**Soil temperature:** 52 to 58 degrees F.

**Calcium carbonate:** The soil is calcareous throughout.

**Solum thickness:** 10 to 24 inches.

#### Control section:

Percent clay--18 to 27 percent.

Rock fragments--Averages 35 to 70 percent, 25 to 60 percent pebbles, 5 to 30 percent cobbles, 0 to 10 percent stones.

Reaction--Moderately alkaline to very strongly alkaline, commonly increases with depth.

Other features--Substratum is commonly stratified.

#### A horizon:

Value--5 through 7 dry, 4 or 5 moist.

Chroma--2 or 3.

#### Btk horizons:

Hue--10YR or 7.5YR.

Value--5 through 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Rock fragments--35 to 60 percent.

Texture--Loam, sandy loam or fine sandy loam.

Consistence--Soft to slightly hard dry, very friable to friable, nonsticky to slightly sticky and nonplastic to slightly plastic.

#### Bk and Bqk horizons:

Hue--10YR or 7.5YR.

Value--5 through 7 dry, 4 through 6 moist.

Chroma--2 through 4.

Texture (2mm fraction)--Stratified fine sandy loam and loam.

Rock fragments--45 to 80 percent pebbles, 5 to 20 percent cobbles, 0 to 5 percent stones.

Other features--Lime pendants are common in most pedons and lime is disseminated or forms thin filaments in some pedons. Accessory silica pendants are in subhorizons in most pedons.

## Mosida Series

The Mosida series consists of very deep, well drained soils that formed in mixed alluvium. Mosida soils are on floodplains. Slopes are 0 to 4 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Torrifluventic Haploxerolls

**Typical pedon:** Mosida loam, in map unit 2350, rangeland (Colors are for dry soil unless otherwise noted.)

A1--0 to 5 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine through coarse roots; many fine tubular pores; 5 percent pebbles; slightly effervescent; mildly alkaline (pH 7.8); clear smooth boundary.

A2--5 to 10 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through coarse roots; many fine tubular pores; 20 percent pebbles; slightly effervescent; mildly alkaline (pH 7.8); clear smooth boundary.

C1--10 to 20 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine through coarse roots; many fine tubular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C2--20 to 33 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; strong fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine through coarse roots; many fine tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C3--33 to 42 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine through coarse roots; many fine tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C4--42 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine through coarse roots; many fine tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

**Type location:** 1,500 feet south of the northwest corner of section 7, T. 9 N., R. 47 E. (38 degrees,

38 minutes, 29 seconds north latitude; 116 degrees, 44 minutes, 47 seconds west longitude.)

#### Range in Characteristics

*Soil moisture:* Usually dry, moist in winter and spring, dry summer and fall.

*Soil temperature:* 47 to 54 degrees.

*Control section:*

Clay content--5 to 18 percent.

#### A horizons:

Value--4 or 5 dry.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

#### C horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Fine sandy loam, loam or silt loam.

Structure--Subangular blocky, granular or massive.

Consistence--Soft to hard dry, very friable to friable moist, nonsticky to slightly sticky and nonplastic to slightly plastic wet.

Reaction--Mildly alkaline or moderately alkaline.

## Muni Series

The Muni series consists of well drained soils that are shallow to a strongly silica-cemented duripan. Muni soils formed in mixed alluvium from volcanic and siliceous sedimentary rocks with a component of loess and volcanic ash. Muni soils are on fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haploxerollic Duragids

**Typical pedon:** Muni gravelly sandy loam, in map unit 2252, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is a partially covered by 55 percent pebbles.

A--0 to 1 inch; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 30 percent pebbles; neutral (pH 7.3); abrupt smooth boundary.

AB--1 to 5 inches; pale brown (10YR 6/3) sandy loam, yellowish brown (10YR 5/4) moist; moderate thin platy structure parting to weak fine and medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine and fine tubular pores; neutral (pH 7.3); clear smooth boundary.

Bt--5 to 14 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; few thin clay films on peds and in pores; mildly alkaline (pH 7.8); abrupt smooth boundary.

Bqkm--14 to 29 inches; very pale brown (10YR 8/4) strongly silica cemented duripan, discontinuous laminar cap, light yellowish brown (10YR 6/4) moist; massive; very hard, very firm, brittle; violently effervescent; clear wavy boundary.

Cqk--29 to 47 inches; very pale brown (10YR 7/3) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; 40 percent pebbles, 10 percent cobbles; 20 percent weakly lime and silica cemented; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

2Ck--47 to 60 inches; very pale brown (10YR 7/3) very gravelly loamy sand, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; 45 percent pebbles; common thick lime coating rock fragments; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** 1,200 feet west and 2,600 feet south of the northeast corner of section 22, T. 13 N., R. 47 E. (38 degrees, 57 minutes, 00 seconds north latitude; 116 degrees, 39 minutes, 44 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Moist in some part from mid-October through June, dry July through early October.

*Soil temperature:* 47 to 52 degrees F.

*Depth to strongly cemented duripan:* 14 to 20 inches.

*Control section:*

Clay content--18 to 35 percent clay, after mixing.

Rock fragments--0 to 15 percent pebbles, after mixing.

#### A horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

#### AB horizon:

Chroma--3 or 4.

#### Bt horizons:

Value--5 through 7 dry, 4 or 5 moist.

Chroma--4 through 6.

Texture--Loam, clay loam, sandy clay loam. Up to 20 percent pebbles in some subhorizons of some pedons.

Structure--Subangular blocky or prismatic.

Consistence--Slightly hard to hard, very friable to friable, slightly plastic to plastic.

Reaction--Neutral or mildly alkaline.

**Bqkm horizon:**

Effervescence--Slightly effervescent to violently effervescent.  
 Cementation--Continuous strongly cemented plates alternating with weakly cemented or uncemented layers.  
 Rock fragments--Up to 30 percent pebbles in subhorizon.

**Cqk horizon:**

Value--5 or 6 moist.  
 Chroma--3 or 4.

**2Ck horizon:**

Value--5 through 7 dry, 4 through 6 moist.  
 Chroma--2 through 4.  
 Rock fragments--35 to 60 percent pebbles, up to 5 percent cobbles.

**Nuyobe Series**

The Nuyobe series consists of very deep, poorly drained soils that formed in lacustrine sediments from mixed rock sources and volcanic ash. Nuyobe soils are on alluvial flats and drainageways. Slopes are 0 to 4 percent. Mean annual precipitation is about 6 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Nuyobe silt loam, in map unit 1150, rangeland. (Colors are for dry soil unless otherwise noted.)

- A1--0 to 3 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- A2--3 to 6 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; moderately thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common fine tubular pores; violently effervescent; very strongly alkaline (pH 9.4); clear smooth boundary.
- A3--6 to 12 inches; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- Bk1--12 to 24 inches; very pale brown (10YR 7/3) finely stratified silt loam, pale brown (10YR 6/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; common soft lime

- masses; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- Bk2--24 to 38 inches; white (10YR 8/2) stratified very fine shallow to silty clay loam, pale brown (10YR 6/3) moist; common distinct brown (7.5YR 5/4) moist mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; 10 percent 1/2 to 3 cm angular lime nodules and common medium soft lime masses; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary.
- Bk3--38 to 60 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2) moist; common distinct brown (7.5YR 5/4) moist mottles; massive; slightly hard, very friable, sticky and plastic; few very fine and fine roots; common fine tubular pores; 20 percent 1 to 5 cm angular lime nodules and common medium soft lime masses; violently effervescent; moderately alkaline (pH 8.4)

**Type location:** 2,000 feet east of the southwest corner of section 32, T. 7 N., R. 46 E. (38 degrees, 29 minutes, 34 seconds north latitude; 116 degrees, 49 minutes, 53 seconds west longitude.)

**Range in characteristics:**

- Soil moisture:** These soils are saturated in some horizon between depths of 24 and 36 inches for a brief period in most years. The capillary fringe moistens the soil to within 6 inches of the surface.
- Soil temperature:** 53 to 59 degrees F.
- Exchangeable sodium:** Sodium absorption ratio is greater than 13, decreases with depth below 20 inches.
- Carbonates:** Strongly effervescent to violently effervescent.
- Control section:**  
 Clay content--Averages 18 to 27 percent. When mixed has less than 15 percent sand coarser than very fine sand and 18 to 27 percent clay.

**A horizons:**

- Hue--10YR, 2.5Y or 5Y.  
 Value--6 through 8 dry; 4 through 6 moist.  
 Chroma--2 through 4. (thin layers of volcanic ash have chroma of 1).  
 Reaction--Strongly alkaline or very strongly alkaline.

**Bk horizons:**

- Hue--10YR, 2.5Y or 5Y.  
 Value--6 through 8 dry; 4 through 6 moist.  
 Chroma--2 through 4. (thin layers of volcanic ash have chroma of 1).  
 Texture--Stratified very fine sandy loam to silty clay loam.  
 Structure--Platy or massive.

Consistence--Soft or slightly hard dry, slightly sticky or sticky and slightly plastic or plastic.  
Reaction--Moderately alkaline or strongly alkaline.

## Old Camp Series

The Old Camp series consists of shallow, well drained soils that formed in residuum and colluvium weathered from tuffs, basalt, rhyolite and andesite with a minor component of volcanic ash. Old Camp soils are on hills and mountains. Slopes are 15 to 50 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Old Camp very gravelly loam, in map unit 1860, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered by 45 percent pebbles and 10 percent cobbles.

A--0 to 3 inches; pale brown (10YR 6/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine and fine vesicular pores; 25 percent pebbles and 10 percent cobbles; neutral (pH 7.3); clear smooth boundary.

Bt1--3 to 6 inches; pale brown (10YR 6/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; soft, very friable; slightly sticky and slightly plastic; common very fine and fine, and few medium roots; many very fine interstitial pores; few clay films on peds; 25 percent pebbles and 10 percent cobbles; slightly effervescent; neutral (pH 7.3); abrupt smooth boundary.

Bt2--6 to 12 inches; brown (10YR 4/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine, and few medium roots; common very fine and fine tubular pores; 25 percent pebbles, 20 percent cobbles and 5 percent stones; common and few clay films on faces of peds, few thin discontinuous lime pendants on rock fragments; slightly effervescent; mildly alkaline (pH 7.6); abrupt irregular boundary.

R--12 inches; hard andesite bedrock, lime coatings on the bedrock surface and in some cracks.

**Type location:** About 800 feet west and 1,000 feet south of the northeast corner of section 12, T. 14 N., R. 38 E. (39 degrees, 05 minutes, 49 seconds north latitude; 117 degrees, 38 minutes, 57 seconds west longitude.)

### Range in characteristics:

*Soil moisture:* Usually dry, moist November through May.

*Soil temperature:* 47 to 52 degrees F.

*Depth to bedrock:* 10 to 20 inches.

#### *Control section:*

Clay content--27 to 35 percent.

Rock fragments--50 to 75 percent, dominantly cobbles and stones. The upper part has 35 to 50 percent rock fragments in some pedons.

#### **A horizon:**

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

#### **Bt horizons:**

Hue--10YR to 7.5YR

Value--4 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Clay loam or sandy clay loam, with subhorizons in some pedons of loam, modified by average of 50 to 75 percent rock fragments, mainly cobbles and stones.

Consistence--Soft to hard dry, very friable to friable, slightly sticky to sticky and slightly plastic to plastic.

Structure--Weak to strong, coarse to fine angular or subangular blocky or massive.

Reaction--Neutral or mildly alkaline in the upper part, neutral to strongly alkaline in the lower part.

Effervescence--Slightly effervescent to strongly effervescent.

Other features--Few to continuous lime coats on rock fragment or bedrock.

## Oricto Series

The Oricto series consists of very deep, well drained soils formed in mixed alluvium from rhyolite, andesite and granodiorite. Oricto soils are on fan piedmonts. Slopes are 2 to 30 percent. The mean annual precipitation is about 4 inches and the mean annual temperature is about 54 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Haplargids

**Typical pedon:** Oricto very cobbly fine sandy loam, in map unit 1290, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent pebbles and 25 percent cobbles.

A--0 to 1 inch; light gray (10YR 7/2) very cobbly fine sandy loam, dark grayish brown (4/2) moist; weak medium platy structure; slightly hard, very friable, nonsticky and nonplastic; many very fine interstitial pores; 15 percent pebbles; 20 percent cobbles;

strongly effervescent; strongly alkaline (pH 8.4); abrupt smooth boundary.

Bt1--1 to 3 inches; very pale brown (10YR 7/3) gravelly sandy clay loam, brown (10YR 5/3) moist; strong medium prismatic structure; hard, firm, sticky and plastic; common very fine and fine roots; common fine interstitial and few fine tubular pores; 25 percent pebbles; common moderately thick clay films in pores and on faces of peds; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

Bt2--3 to 9 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial pores; 40 percent pebbles; 5 percent cobbles; common moderately thick clay films in pores and on faces of peds; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

Bk--9 to 19 inches; light gray (10YR 7/2) very gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine, fine and few medium roots; many very fine and fine interstitial pores; 40 percent pebbles; lime coating underside of rock fragments; violently effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

2C--19 to 36 inches; light gray (10YR 7/2) finely stratified extremely gravelly loamy coarse sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 65 percent pebbles; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

3C--36 to 60 inches; dark yellowish brown (10YR 4/4) finely stratified very gravelly loam to extremely gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, slightly sticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 40 percent pebbles; strongly effervescent; fine salt masses disseminated throughout; strongly alkaline (pH 8.8).

**Type location:** 2,000 feet north and 500 feet east of the southwest corner of section 32, T. 13 N., R. 34 E. (38 degrees, 56 minutes, 55 seconds north latitude; 118 degrees, 10 minutes, 48 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms. Dry in lower moisture control section.

**Soil temperature:** 55 to 59 degrees F.

**Reaction:** Strongly alkaline or very strongly alkaline.

**Depth to 2C horizon:** 9 to 19 inches.

**Depth to bottom of Bt horizon:** 6 to 9 inches.

**Control section:**

Rock fragments--Averages 35 to 60 percent, mainly pebbles.

#### A horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Carbonates--Slightly effervescent to violently effervescent.

#### Bt horizons:

Value--5 through 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Rock fragments--35 to 55 percent

Texture (less than 2 mm)--Loam or sandy clay loam.

Clay content--20 to 27 percent.

Structure--Prismatic or subangular blocky.

Consistence--Soft to hard, very friable to firm, slightly sticky to sticky and slightly plastic to plastic.

Carbonates--Strongly to violently effervescent.

Sodium absorption rate--13 to 45.

#### Bk horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Rock fragments--40 to 70 percent.

Texture (less than 2 mm)--Sandy loam or coarse sandy loam.

Structure--Massive or subangular blocky.

Consistence--Nonplastic to slightly plastic.

Carbonates--Strongly to violently effervescent.

#### C horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--1 through 3.

Rock fragments--40 to 70 percent.

Texture (less than 2 mm)--Stratified coarse sand and loamy sand.

Consistence--Soft to hard dry, very friable to firm, nonsticky to slightly sticky and nonplastic to slightly plastic.

Carbonates--Slightly to violently effervescent.

## Orovada Series

The Orovada series consists of very deep, well drained soils that formed in loess high in volcanic ash over alluvium from mixed rock sources. The Orovada soils are on fan skirts and fan piedmonts. Slopes are 0 to 8 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Camborthids

**Typical pedon:** Orovada fine sandy loam, in map unit 2220, rangeland. (Colors are for dry soils unless otherwise noted.)

A1--0 to 2 inches; light gray (10YR 7/2) fine sandy loam, dark brown (10YR 3/3) moist; weak moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; many very fine through medium vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary. (Combination of A horizons 2 to 8 inches thick)

A2--2 to 5 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and fine interstitial pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bw--5 to 13 inches; light brownish gray (10YR 6/2) loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through fine roots; common fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bq--13 to 22 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; 30 percent 1 inch silica cemented durinodes that are very hard, firm and brittle when wet; moderately alkaline (pH 8.2); clear wavy boundary.

Bqk1--22 to 34 inches; pale brown (10YR 6/3) stratified fine sandy loam, to silt loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine interstitial, and few very fine tubular pores; 30 percent 3/4 to 1 1/2 inch silica cemented durinodes that are very hard, firm and brittle when wet; common fine and medium distinct white (10YR 8/1) lime segregations; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bqk2--34 to 60 inches; pale brown (10YR 6/3) finely stratified silt loam, dark brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine interstitial and few very fine tubular pores; 10 percent 1/2 to 1 inch silica cemented durinodes that are hard, firm and brittle when wet; few medium and coarse distinct white (10YR 8/1) lime segregations; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** 100 feet north and 300 feet west of the

southwest corner of section 3, T. 15 N., R. 47 E. (39 degrees, 09 minutes, 34 seconds north latitude; 116 degrees, 39 minutes, 14 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring, dry from late June through early November.

*Soil temperature:* 47 to 52 degrees F.

*Depth to Bq or Bqk horizon:* 10 to 28 inches.

#### Control section:

Clay content--5 to 18 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

Other features--When mixed, value of the upper 7 inches is greater than 5.5 dry and 3.5 moist.

#### A horizons:

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 through 4.

Reaction--Neutral to moderately alkaline.

#### Bw horizon:

Hue--10YR or 2.5Y.

Value--6 through 8 dry; 3 through 6 moist.

Chroma--2 through 6.

Texture--Fine sandy loam, very fine sandy loam, loam, silt loam with strata of loamy fine sand or sandy loam in some pedon.

Clay content--5 to 18 percent.

Rock fragments--Averages 0 to 15 percent pebbles.

Structure--Subangular blocky, prismatic, or horizon is massive.

Consistence--Soft to slightly hard, very friable to friable.

Reaction--Mildly alkaline or moderately alkaline.

#### Bq or Bqk horizons:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 through 6.

Texture--Fine sandy loam, very fine sandy loam, loam, silt loam with strata of loamy fine sand or sandy loam in some pedons.

Rock fragments--Up to 30 percent pebbles in some subhorizons of some pedons.

Consistence--Soft to hard dry, nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Reaction--Moderately alkaline to very strongly alkaline, commonly increasing with depth.

Cementation--Contains 20 to 80 percent durinodes.

Horizons with less than 20 percent durinodes are common below 40 inches in some pedons.

Other features--Gypsum crystals are below depths of 37 inches in some pedons. Duripans or very gravelly strata are found below depths of 40 inches in some pedons.

## Packer Series

The Packer series consist of deep and very deep, well drained soils that formed in residuum and colluvium weathered from extrusive volcanic rocks with component of loess and volcanic ash. The Packer soils are on mountain crests and side slopes. Slopes are 15 to 50 percent. The mean annual precipitation is about 15 inches and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed Argic Cryoborolls

**Typical pedon:** Packer very gravelly loam, in map unit 1540, rangeland. (Colors for dry conditions unless otherwise noted.) The surface is covered with 35 percent pebbles and 10 percent cobbles.

A1--0 to 3 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and common fine roots; common fine interstitial pores; 25 percent pebbles, 10 percent cobbles, 2 percent stones; neutral (pH 6.8); clear smooth boundary.

A2--3 to 10 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; common fine tubular pores; 40 percent pebbles, 10 percent cobbles, 5 percent stones; neutral (pH 7.2); clear smooth boundary.

2Bt--10 to 20 inches; pale brown (10YR 6/3) extremely cobbly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; 40 percent pebbles, 20 percent cobbles, 5 percent stones; few thin clay films on faces of peds and lining pores; neutral (pH 7.2); abrupt smooth boundary.

2C--20 to 60 inches; pale brown (10YR 6/3) extremely cobbly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; few fine tubular pores; 40 percent pebbles, 20 percent cobbles, 5 percent stones; neutral (pH 7.2).

**Type location:** 400 feet south and 600 feet west of the northeast corner of section 8, T. 1 N., R. 49 E. (37 degrees, 56 minutes, 55 seconds north latitude; 116 degrees, 30 minutes, 45 seconds west longitude.)

### Range in characteristics:

**Soil moisture:** Usually dry, moist winter and spring, dry summer and fall.

**Soil temperature:** 42 to 45 degrees F.

**Average summer soil temperature:** 57 to 59 degrees F.

**Mollic epipedon thickness:** 7 to 13 inches, includes upper Bt horizon in some pedons.

**Depth to base of Bt horizon:** 9 to 21 inches.

**Depth to bedrock:** 40 to more than 60 inches.

**Other features:** Thin BA and BC horizons are common in some pedons.

### Control section:

Clay content--18 to 30 percent, when averaged.

Rock fragments--60 to 80 percent with 25 to 60 percent pebbles, 20 to 40 percent cobbles and up to 10 percent stones.

### A horizons:

Chroma--2 or 3.

### Bt horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Extremely cobbly clay loam, extremely cobbly sandy clay loam or extremely cobbly loam.

Structure--Weak or moderate, very fine to medium, angular or subangular blocky or massive.

Consistence--Slightly hard or hard dry, slightly sticky to very sticky and slightly plastic to very plastic wet.

### 2C horizon:

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 through 6.

Texture--Extremely cobbly loam, extremely cobbly fine sandy loam, extremely cobbly sandy loam or extremely cobbly loamy sand.

Rock fragments--25 to 50 percent pebbles, 20 to 35 percent cobbles, and up to 10 percent stones.

Consistence--Soft to very hard, dry; very friable or friable moist, slightly sticky or sticky and nonplastic to plastic wet.

## Paranat Series

The Paranat series consists of very deep, poorly drained soils that formed in mixed alluvium. Paranat soils are on floodplains. Slopes are 0 to 2 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Fluvaquentic Endoaquolls

**Typical pedon:** Paranat silt loam, in map unit 2321, rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 4 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak moderately platy structure; soft, very friable; slightly

- sticky and slightly plastic; many very fine through medium roots; many very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- A2--4 to 11 inches; grayish brown (10YR 5/2) silt loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine through medium roots; few very fine tubular and common very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); clear boundary.
- A3--11 to 18 inches; grayish brown (10YR 5/2) silt loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine through medium roots; common fine tubular pores; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- AC--18 to 38 inches; gray (10YR 6/1) finely stratified silt loam, very dark gray (10YR 3/1) moist; few fine faint iron mottles, brown (7.5YR 4/4), dark brown (7.5YR 3/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common very fine tubular and few fine tubular and interstitial pores; violently effervescent lime occurs as few fine and medium segregated filaments or threads; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- C1--38 to 52 inches; light gray (10YR 7/1) stratified very fine sandy loam to silty clay, dark grayish brown (2.5Y 4/2) moist; common fine distinct iron mottles; brown (7.5YR 4/4) dark brown (7.5YR 3/2) moist; massive; slightly hard, very friable, sticky and plastic; few very fine and fine roots; very fine and fine tubular and few fine interstitial pores; few fine, segregated white (10YR 8.2) and light gray (10YR 7/2) moist lime in filaments or threads; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- C2--52 to 60 inches; light gray (10YR 7/2) silt loam, grayish brown (2.5Y 5/2) moist; common fine distinct iron mottles, brown (7.5YR 4/4) dark brown (7.5YR 3/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- Type location:** 900 feet west and 300 feet north of the southeast corner of section 35, T. 15 N., R. 47 E. (39 degrees, 05 minutes, 12 seconds north latitude; 116 degrees, 38 minutes, 25 seconds west longitude.)
- Range in characteristics:**
- Soil moisture:** Dry in mid-summer and early fall, moist in late fall, winter, spring, and early summer. Apparent seasonal water table is between 18 and 40 inches in winter to early summer months. Drained phases are recognized.
- Soil temperature:** 47 to 52 degrees F.
- Thickness of mollic epipedon:** 10 to 20 inches.
- Calcium carbonate equivalent:** 1 to 10 percent.
- Effervescence:** The soil is effervescent throughout.
- Reaction:** Moderately alkaline to strongly alkaline, usually decreasing with depth.
- Exchangeable sodium:** 0 to 15 percent. Saline-sodic phases with strong salinity and slight to moderate sodicity in the upper part are recognized.
- Control section:**  
Clay content--18 to 35 percent.  
Rock fragments--Less than 5 percent.
- A horizons:**  
Hue--10YR or 2.5Y.  
Value--4 or 5 dry, 2 or 3 moist.  
Chroma--1 or 2.  
Other features--One or more buried A horizons up to 8 inches thick occur in some pedons.
- C horizons:**  
Hue--10YR or 2.5Y.  
Value--6 through 8 dry, 4 through 7 moist.  
Chroma--1 through 4.  
Texture--Stratified silty clay loam and silt loam with thin strata of very fine sandy loam or silty clay in some pedons.  
Carbonates--Up to 15 percent lime filaments, soft masses, or concretions in some pedons with up to 40 percent in some subhorizons below 40 inches.  
Consistence--Soft or slightly hard, dry, very friable or friable, moist; slightly sticky to very sticky and slightly plastic to plastic, wet.

## Penoyer Series

The Penoyer series consists of very deep, well drained soils that formed in alluvium from limestone, volcanic rocks and lacustrine sediments. Penoyer soils are on inset fans. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 54 degrees F.

**Taxonomic class:** Coarse-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Penoyer silt loam, in map unit 1021, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, sticky and plastic; few fine roots; many very fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C1--3 to 13 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C2--13 to 28 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable, sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C3--28 to 43 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C4--43 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; common fine tubular and interstitial pores; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** 1,500 feet south and 50 feet east of the northwest corner of section 17, T. 5 N., R. 48 E. (38 degrees, 15 minutes, 29 seconds north latitude; 116 degrees, 40 minutes, 30 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Control section:**

Clay content--Averages 10 to 18 percent.

#### A horizon:

Hue--7.5YR or 10YR.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 through 4.

#### C horizons:

Hue--7.5YR or 10YR.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Structure--Platy or massive.

Consistence--Soft to hard, very friable or friable, slightly to sticky and slightly plastic to plastic.

Texture--Silt loam, but strata of very fine sandy loam, loam or silty clay loam are in some pedons.

Carbonates--Strongly effervescent or violently effervescent.

Reaction--Moderately alkaline to very strongly alkaline.

## Pineval Series

The Pineval series consists of very deep, well drained soils that formed in mixed alluvium derived mainly from basalt and rhyolite. Pineval soils are on fan piedmonts. Slopes are 2 to 30 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Pineval gravelly loam, in map unit 2272, rangeland. (Colors are for dry soils unless otherwise noted.) The surface is covered with 30 percent pebbles and 10 percent cobbles.

A--0 to 4 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine vesicular pores; 20 percent pebbles and 5 percent cobbles; moderately alkaline (pH 8.4); clear smooth boundary.

Bt1--4 to 9 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common fine tubular pores; common thin clay films on peds and in pores; 35 percent pebbles and 5 percent cobbles; moderately alkaline (pH 8.4); clear smooth boundary.

Bt2--9 to 13 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; common fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine, few medium roots; common fine tubular pores; few thin clay films on peds and common thin clay films in pores; 45 percent pebbles and 10 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bqk--13 to 26 inches; light gray (10YR 7/2) finely stratified very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; common fine tubular pores; 35 percent pebbles and 10 percent cobbles; 30 percent weak and very weak discontinuous silica cementation; common thin lime on underside of rock fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Bqk--21 to 60 inches; variegated stratified very gravelly sandy loam to extremely gravelly sand; massive; soft to hard, very friable to firm, nonsticky and nonplastic; few very fine roots; 60 percent pebbles and 10 percent cobbles; discontinuous weak silica cementation with several 1/2 to 6 inches thick discontinuous lenses of strong silica

cementation; slightly effervescent with strongly effervescent lime coatings on underside of pebbles; moderately alkaline (pH 8.4).

**Type location:** 100 feet north and 1,200 feet east of the southwest corner of section 31, T. 15 N., R. 39 E. (39 degrees, 06 minutes, 53 seconds north latitude; 117 degrees, 37 minutes, 47 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Moist in winter and spring, dry mid June through October.

*Soil temperature:* 47 to 52 degrees F.

Reaction--Neutral, mildly alkaline or moderately alkaline.

**A horizon:**

Hue--10YR or 2.5Y.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

**Bt horizon:**

Value--5 or 6 dry.

Chroma--3 or 4

Texture--Very gravelly loam, very gravelly clay loam, or very gravelly sandy clay loam.

Structure--Subangular blocky or is massive.

Consistence--Soft or slightly hard, dry; plastic or very plastic, wet.

Clay content--25 to 35 percent.

Rock fragments--35 to 60 percent, mostly pebbles.

**Bqk and 2Bqk horizons:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Texture--Stratified very gravelly sandy loam to extremely gravelly sand.

Consistence--Soft to hard dry, very friable to firm moist, nonsticky to slightly sticky and nonplastic to slightly plastic wet.

Rock fragments--35 to 70 percent, mostly pebbles.

## Pintwater Series

The Pintwater series consists of shallow, well drained soils that formed in residuum and colluvium from rhyolite, tuff, and related rocks. Pintwater soils are on rock pediments and hills. Slopes are 2 to 50 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents

**Typical pedon:** Pintwater gravelly fine sandy loam, in map unit 1953, rangeland. (Colors are for dry soil

unless otherwise noted.) The surface is covered with 25 percent pebbles and 5 percent cobbles.

A1--0 to 1 inch; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine vesicular pores; 25 percent pebbles and 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (0 to 2 inch thick)

A2--1 to 4 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common very fine and fine vesicular pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bqk--4 to 15 inches; very pale brown (10YR 7/3) very cobbly fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; common fine tubular pores; 25 percent cobbles and 30 percent pebbles; violently effervescent; silica and lime stalactites on underside of pebbles; moderately alkaline (pH 8.4); abrupt wavy boundary.

R--15 inches; hard volcanic rock; silica lime coatings in fractures and on the underside of each loose fragment of rock, often as stalactites.

**Type location:** 1,100 feet north and 1,400 feet east of the southwest corner of section 35 T. 11 N., R. 35 E. (38 degrees, 46 minutes, 20 seconds north latitude; 118 degrees, 00 minutes, 49 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 57 degrees F.

*Reaction:* Moderately alkaline or strongly alkaline.

*Depth to bedrock:* 10 to 20 inches.

*Control section:*

Clay content--10 to 18 percent.

Rock fragments--35 to 70 percent.

**A horizon:**

Value--6 or 7 dry, 4 through 6 moist.

Chroma--2 or 3.

Carbonates--Slightly effervescent to strongly effervescent.

**Bqk horizon:**

Value--6 through 8 dry, 4 through 6 moist.

Chroma--2 through 4.

Texture--Fine sandy loam or sandy loam.

Rock fragments--45 to 70 percent, includes stones, cobbles, and pebbles.  
 Consistence--Nonsticky to slightly sticky and nonplastic to slightly plastic wet.  
 Carbonates--Lime occurs as pendants or coatings on rock fragments or as soft masses and filaments. Strongly effervescent or violently effervescent.  
 Other features--Accessory silica pendants or coatings are in some pedons.

## Portmount Series

The Portmount series consists of very deep, well drained soils that formed in mixed alluvium. The Portmount soils are on fan piedmonts. Slopes are 0 to 8 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 52 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Xerollic Haplargids

**Typical pedon:** Portmount gravelly sandy loam, in map unit 2400, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 40 percent pebbles.

A--0 to 4 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common fine and very fine vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bt--4 to 12 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common fine interstitial and tubular pores; common clay films on faces of peds and lining pores; 10 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

2Btk--12 to 26 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine, fine and medium roots; common very fine and fine interstitial and tubular pores; few thin clay films lining pores; 25 percent pebbles, 5 percent cobbles, pebbles are lime-coated; noneffervescent matrix; strongly effervescent lime coats and seams; moderately alkaline (pH 8.2); clear smooth boundary.

2Bk--26 to 46 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine, fine and medium roots; many very fine and fine interstitial pores; 25 percent pebbles; common thin

lime seams and soft masses; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2Cqk--46 to 60 inches; light brownish gray (10YR 6/2) gravelly sandy loam, brown (10YR 4/3); massive; hard, friable, nonsticky and nonplastic; roots in pockets, few fine tubular pores; 20 percent pebbles, 5 percent cobbles; 40 percent weakly cemented lenses, 20 percent strongly silica and lime cemented nodules; common fine lime seams and filaments; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** 2,000 feet north and 2,000 feet west of the southeast corner of section 5, T. 9 N., R. 46 E. (38 degrees, 53 minutes, 56 seconds north latitude; 116 degrees, 49 minutes, 13 seconds west longitude.)

### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring, dry in summer and fall.

*Soil temperature:* 47 to 52 degrees F.

*Depth to the Btk horizon:* 12 to 28 inches.

*Control section:*

Clay content--Averages less than 18 percent.

Rock fragments--Averages 15 to 35 percent.

### A horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4

### Bt and Btk horizons:

Value--5 through 7 dry, 3 through 5 moist

Chroma--2 through 4

Texture--Sandy loam or sandy clay loam

Clay content--Averages less than 18 percent

Structure--Subangular blocky or massive.

Consistence--Soft or slightly hard, nonsticky to sticky and nonplastic to plastic.

### 2Bk horizon:

Value--6 through 8 dry, 4 through 7 moist

Chroma--2 through 4

Texture--Sandy loam or loam

Rock fragments--15 to 35 percent

Consistence--Soft to slightly hard, very friable to friable, nonplastic to plastic and nonsticky to slightly sticky.

## Rebel Series

The Rebel series consists of very deep, well drained soils that formed in mixed alluvium. Rebel soils are on inset fans, axial stream terraces, fan skirts, and stream terraces. Slopes are 0 to 8 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 52 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Xerollic Camborthids

**Typical pedon:** Rebel sandy loam, in map unit 1970, rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; moderate thick platy structure; soft, very friable, nonsticky and nonplastic; many very fine and fine vesicular pores; 5 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary.

A2--2 to 9 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and medium roots; common very fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary.

Bw--9 to 23 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and medium roots; common very fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.6); clear smooth boundary.

Bk1--23 to 33 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and medium roots; common very fine tubular pores; 5 percent pebbles; lime coating underside of rock fragments; slightly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

Bk2--33 to 60 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; many very fine interstitial and tubular pores; 5 percent pebbles; few thin lime coatings on underside of rock fragments; few fine lime filaments; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** 150 feet south and 1,100 feet east of the northwest corner of section 14, T. 15 N., R. 47 E. (39 degrees, 08 minutes, 35 seconds north latitude; 116 degrees, 39 minutes, 02 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in winter and spring, dry summer and fall.

**Soil temperature:** 47 to 52 degrees F.

**Combined thickness of A and Bw horizons:** 15 to 24 inches.

**Sand content:** 50 to 80 percent.

**Depth to lime:** 15 to 24 inches.

**Other features:** Mica flakes are common or many in a major part of the particle-size control section.

#### Control section:

Clay content--10 to 18 percent.

Rock fragments--Averages 2 to 15 percent, mainly pebbles.

#### A horizons:

Hue--2.5Y or 10YR.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral to mildly alkaline.

Other features--Slightly effervescent in some pedons due to recharge from calcareous dust.

#### Bw horizon:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Fine sandy loam, sandy loam or loam.

Consistence--Soft to slightly hard, dry; friable or very friable, moist; nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Reaction--Neutral to moderately alkaline.

#### Bk horizons:

Hue--10YR or 2.5Y.

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 5 dry, 2 through 4 moist.

Texture--Fine sandy loam, sandy loam or loam.

Rock fragments--Some pedons contain strata with up to 50 percent pebbles.

Structure--Subangular blocky or massive.

Consistence--Soft or slightly hard, dry; nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Reaction--Mildly alkaline to strongly alkaline.

Other features--Subhorizons with coarse sandy loam are common in some pedons.

## Ricert Series

The Ricert series consists of very deep, well drained soils formed in thin loess deposits over alluvium weathered from mixed rock sources. The Ricert soils are on fan piedmonts. Slopes are 2 to 8 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Natrargids

**Typical pedon:** Ricert very gravelly sandy loam, in map unit 1304, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 45 percent pebbles and 10 percent cobbles.

A1--0 to 3 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate

thick platy structure; soft, very friable, nonsticky and slightly plastic; few very fine roots; common very fine and fine interstitial pores; 35 percent pebbles, 5 percent cobbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

A2--3 to 6 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky; soft, very friable, nonsticky and slightly plastic; many very fine and fine roots; few fine and medium tubular pores; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

Btn--6 to 12 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and plastic; many very fine and fine roots; common fine and medium tubular pores; common thin clay films in pores and on faces of peds; 10 percent pebbles; strongly effervescent; strongly alkaline (pH 8.5); abrupt wavy boundary.

Btkn--12 to 18 inches; light yellowish brown (10YR 6/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure parting to weak coarse and moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium interstitial pores; common thin clay films in pores and coating faces of peds; 10 percent pebbles; strongly effervescent; few thin lime seams; strongly alkaline (pH 8.5); abrupt smooth boundary.

Bqk--18 to 31 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; few fine roots; few fine interstitial pores; 10 percent pebbles; continuous brittle matrix, some discontinuous layers are strongly silica and lime cemented; violently effervescent; strongly alkaline (pH 8.5); abrupt smooth boundary.

2Bk--31 to 60 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; common fine interstitial pores; 40 percent pebbles, 5 percent cobbles; lime coating underside of pebbles, common soft lime masses; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** 1,400 feet north and 500 feet east of the southwest corner of section 27, T. 14 N., R. 36 E. (39 degrees, 02 minutes, 39 seconds north latitude; 117 degrees, 55 minutes, 23 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring, dry mid May through November.

*Soil temperature:* 47 to 52 degrees F.

*Depth to Bqk horizon:* 14 to 25 inches.

#### Control section:

Clay content--25 to 35 percent.

Rock fragments--0 to 10 percent, mainly pebbles.

#### A horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

#### Btn and Btkn horizons:

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 through 6.

Texture--Loam or clay loam.

Reaction--Strongly alkaline or very strongly alkaline.

Exchangeable sodium percentage--15 to 35 percent.

Consistence--Slightly hard to hard, slightly sticky to sticky and slightly plastic to plastic.

#### Bqk horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 through 6.

Texture--Loam, silt loam, clay loam.

Reaction--Strongly alkaline or very strongly alkaline.

Cementation--Continuous hard firm brittle matrix with discontinuous cemented lenses in some pedons.

#### 2Bk horizon:

Value--6 or 7 dry, 4 through 6 moist.

Chroma--2 through 4.

Texture--Very gravelly sandy loam, very gravelly loamy sand or extremely gravelly loamy sand; some pedons have subhorizons with coarse sand.

Rock fragments--35 to 70 percent, mainly pebbles. (Commonly increases with depth)

Reaction--Strongly alkaline or very strongly alkaline.

Gypsum--Present in some pedons.

## Roic Series

The Roic series consists of very shallow and shallow, well drained soils formed in residuum and colluvium from tuffaceous sandstone, shale, and other hard lacustrine materials. Roic soils are on rock pediments and hills. Slopes are 4 to 30 percent. Mean annual precipitation is about 4 inches, mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Typic Torriorthents

**Typical pedon:** Roic gravelly sandy loam, in map unit 2130, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 45 percent pebbles.

A--0 to 1 inch; light gray (10YR 7/2) gravelly sandy loam, brown (10YR 4/3) moist; strong moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine vesicular pores; 30 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary. (1/2 to 4 inches thick)

C--1 to 5 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; 40 percent pebble size fragments of lacustrine material that crush to silt loam, very fine sandy loam and loam; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; common fine interstitial and tubular pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

2Cr1--5 to 15 inches; light gray (10YR 7/2) semiconsolidated lacustrine sediments, brown (10YR 5/3) moist; massive; very hard, extremely firm; root mats in fracture planes; strongly alkaline (pH 8.6); clear wavy boundary.

2Cr2--15 to 60 inches; very pale brown (10YR 7/3) semiconsolidated lacustrine sediments, yellowish brown (10YR 5/4) moist; massive; very hard, very firm, few fine lime seams along fracture planes; strongly alkaline (pH 8.6)

**Type location:** 1,700 feet south and 800 feet east of the northwest corner of section 3, T. 8 N., R. 38 E. (38 degrees, 35 minutes, 15 seconds north latitude; 117 degrees, 41 minutes, 51 seconds west longitude.)

#### Range in characteristics

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 57 degrees F.

**Depth to paralithic contact:** 4 to 14 inches.

#### Control section:

Carbonates--Noneffervescent to strongly effervescent.

Reaction--7.9 to 9.0, moderately alkaline or strongly alkaline.

Other features--The lacustrine material is very firm or extremely firm, has a hardness of less than 3, and may be dug with difficulty with a spade when moist.

#### C horizon:

Hue--7.5YR, 10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist

Chroma--2 through 4.

Structure--Platy or massive.

Consistence--Soft or slightly hard, dry; nonsticky to slightly sticky and nonplastic or slightly plastic, wet.

Texture (less than 2 mm fraction)--Fine sandy loam, very fine sandy loam, sandy loam or loam with less than 18 percent clay.

## Rose Creek Series

The Rose Creek series consist of very deep, poorly drained soils that formed in stratified mixed alluvium. Rose Creek soils are on flood plains and stream terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Fluvaquentic Endoaquolls

**Typical pedon:** Rose Creek loam, in map unit 2430 rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 4 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine to medium roots; common very fine to medium pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary. (Combined thickness of A horizon 4 to 20 inches thick.)

A2--4 to 11 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; many fine to medium roots; common very fine to medium pores; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C1--11 to 22 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; few distinct dark yellowish brown (10YR 4/6) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine to medium roots; few very fine to medium pores; slightly effervescent; moderately alkaline (pH 8.2) clear smooth boundary. (5 to 44 inches thick.)

C2--22 to 60 inches; light brownish gray (10YR 6/2) stratified gravelly sand to silt loam, dark grayish brown (10YR 4/2) moist; many prominent dark yellowish brown (10YR 4/6) mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine to medium roots, common fine tubular pores; slightly effervescent; moderately alkaline (pH 8.2).

**Type location:** 2,600 feet west and 1,600 feet north of the southeast corner of section 15, T. 13 N., R. 40 E. (38 degrees, 59 minutes, 28 seconds north latitude; 117 degrees, 27 minutes, 55 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Dry in mid-summer and early fall, moist in late fall, winter, spring, and early summer. Saturated to within a depth of 10 inches of the surface for short periods during most years. Apparent seasonal water table is between 20 and 36 inches during the spring. Drained phases are recognized.

*Soil temperature:* 47 to 52 degrees F.

*Mollic epipedon thickness:* 10 to 18 inches.

*Effervescence:* Slightly effervescent through most of the profile, but individual horizons range from noneffervescent to violently effervescent in some pedons.

*Profile reaction:* Neutral to very strongly alkaline, depending on the presence of sodium and lime.

**Control section:**

Clay content--8 to 18 percent, when averaged.

**A horizon:**

Hue--10YR or 2.5Y.

Value--4 or 5 dry, 2 or 3 moist, the surface 1 to 3 inches in some pedons has value of 7 dry and 4 moist as a result of flood deposition.

Chroma--1 or 2.

Other features--Buried A horizons are in some pedons.

**C horizons:**

Hue--10YR through 5Y.

Value--5 through 7 dry and 3 through 6 moist.

Chroma--1 through 3.

Texture--Stratified and averages sandy loam, fine sandy loam, very fine sandy loam, or loam with more than 15 percent fine sand and coarser particles. Includes stratified sand to silt loam and may include strata of coarse sand or silty clay loam.

Consistence--Very friable to friable.

Redox concentration--Mottles with hues of 2.5YR through 10YR and chroma of 3 through 8 are usually at a depth of 20 to 40 inches, but are as shallow as 3 inches in some pedons that are irrigated by controlled flooding.

Consistence--Loose through hard, dry; loose or very friable or friable, moist.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Typic Torriorthents

**Typical pedon:** Rosney silt loam, in map unit 2321, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; common very fine and fine vesicular pores; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary.

C1--3 to 15 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine interstitial, and few very fine and fine tubular pores; violently effervescent; very strongly alkaline (pH 9.2); clear smooth boundary.

C2--15 to 24 inches; pale brown (10YR 6/3) finely stratified silt loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic, common very fine and fine roots; common fine tubular pores; violently effervescent; very strongly alkaline (pH 9.2); clear smooth boundary.

2C3--24 to 36 inches; pale brown (10YR 6/3) stratified silt loam to silty clay loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; common very fine and fine roots; few very fine and fine tubular pores; common fine distinct white (10YR 8/2) gypsum crystals; strongly effervescent; very strongly alkaline (pH 9.2); clear smooth boundary.

2C4--36 to 60 inches; pale brown (10YR 6/3) silty clay, brown (10YR 4/3) moist; massive; slightly hard, very friable, sticky and plastic; few very fine roots; many very fine interstitial pores; many medium distinct white (10YR 8/1) gypsum crystals; slightly effervescent; very strongly alkaline (pH 9.2).

**Type location:** 50 feet east and 2,000 feet south of the northwest corner of section 31, T. 12 N., R. 47 E. (38 degrees, 50 minutes, 24 seconds north latitude; 116 degrees, 44 minutes, 03 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part for short periods from late October through May.

*Soil temperature:* 47 to 52 degrees F.

*Depth to 2C horizon:* 20 to 36 inches.

*Profile reaction:* Moderately alkaline to very strongly alkaline.

*Texture:* Dominantly silt loam with thin strata of very fine sandy loam and volcanic ash in the upper part over stratified silt loam to silty clay dominantly silty clay loam in the lower part.

**Rosney Series**

The Rosney series consists of very deep, well drained soils that formed in loess capped silty alluvium or lacustrine materials derived from mixed rock sources with some influence of volcanic ash. The Rosney soils are on alluvial flat remnants. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 49 degrees F.

**Mineralogy:** Mixed, but is influenced by volcanic ash and other pyroclastic materials.

**Effervescence:** Slightly effervescent to violently effervescent.

**Electrical conductivity:** 15 to 35 mmhos/cm.

**Exchangeable sodium:** 35 to 80 percent.

**Control section:**

Clay content--10 to 18 percent in the upper part and 25 to 35 percent in the lower part, averages 20 to 30 percent.

Other features--Few to many crystals of gypsum are usually present, but in some pedons are common only in the lower substratum. Some pedons have weakly to strongly silica cemented horizons below a depth of 40 inches.

**A horizon:**

Hue--10YR or 2.5Y.

Value--6 through 8 dry, 4 or 5 moist.

Chroma--2 through 4.

**C horizons:**

Hue--10YR or 2.5Y.

Value--6 through 8 dry, 4 or 5 moist.

Chroma--2 through 4.

Structure--Massive or moderate fine granular.

Consistence--Soft to hard, very friable to firm, slightly plastic to plastic.

## Rotinom Series

The Rotinom series consists of very deep, well drained soils that formed in loess and alluvium weathered from mixed rock sources with a component of volcanic ash. These soils are on stream terraces. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Durorthidic Torrifuvents

**Typical pedon:** Rotinom silt loam, in map unit 2230, rangeland (Colors are for dry soil unless otherwise noted).

A1--0 to 2 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; moderately thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary

A2--2 to 5 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderately thick platy structure parting to moderate fine granular; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine vesicular pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary

A3--5 to 8 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderately thick platy structure parting to moderate fine granular; soft, very friable, slightly sticky and slightly plastic; common very fine and common fine roots; many very fine and few fine vesicular pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary

Bk--8 to 19 inches; pale brown (10YR 6/3) silt loam, yellowish brown (10YR 5/4) moist; moderately thick platy; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; common fine and medium lime coats on plate surfaces; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary

2Bqk1--19 to 23 inches; white (10YR 8/2) loam, grayish brown (10YR 5/2) moist; strong thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine and common fine roots; common very fine and fine tubular pores; common fine lime and silica coats on surfaces of plates; banded lenses of volcanic ash; strongly effervescent; strongly alkaline (pH 8.4); abrupt smooth boundary

2Bkq2--23 to 30 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thin platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine and common fine roots; few medium common very fine and fine tubular pores; thin discontinuous ash lenses; 20 percent hard, firm and brittle discontinuous weakly silica-cemented lenses; many medium lime coats on plate surfaces; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary

3Aqkb1--30 to 32 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few medium, common very fine and fine tubular pores; continuous thin silica coats on faces of peds; common fine and medium lime filaments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary

3Aqkb2--32 to 40 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; silica bridges between sand grains; common fine lime filaments; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary

3Ck1--40 to 51 inches; light olive gray (5Y 6/2) sandy loam, olive gray (5Y 4/2) moist; common fine distinct yellowish brown (10YR 5/6) relict mottles; dark yellowish brown (10YR 3/6) moist; massive; slightly hard, friable, slightly sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; few fine lime filaments; strongly

effervescent; moderately alkaline (pH 8.4); clear wavy boundary  
 3Ck2--51 to 60 inches; light olive gray (10YR 6/2) sandy loam, olive gray (5Y 4/2) moist; common medium distinct yellowish brown (10YR 5/6) relict mottles dark yellowish brown (10YR 4/6) moist; few fine prominent yellowish red (5YR 5/6) relict mottles, dark reddish brown (5YR 3/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; common fine manganese coats and concretions; common fine lime filaments; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

**Type location:** 1,000 feet south and 500 feet west of the northeast corner of section 11, T. 15 N., R. 47 E. (39 degrees, 09 minutes, 21 seconds north latitude; 116 degrees, 38 minutes, 15 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part from November through early May, dry late May through October.

*Soil temperature:* 47 to 52 degrees F.

*Depth to buried A horizon:* 20 to 35 inches.

*Depth to discontinuous weak silica-cementation:* 10 to 23 inches with the horizon being 20 to 60 percent discontinuously cemented.

*Reaction:* Moderately alkaline to strongly alkaline.

*Other features:* Some pedons have relict mottles below 40 inches.

*Sand content:* Less than 15 percent particles coarser than very fine sand.

*Control section:*

Clay content 18 to 27 percent

Rock fragments--Up to 5 percent in some horizons

**A horizons:**

Value--6 or 7 dry, 4 or 5 moist

Chroma--2 through 4.

Carbonates--None to strongly effervescent

**Bk and Bqk horizons:**

Hue 10YR, 2.5Y, or 5Y.

Value--5 through 8 dry, 3 through 5 moist.

Chroma--1 through 4.

Texture--Dominantly silt loam with strata of silty clay loam common in most pedons. Some pedons have very thin lenses of loam, very fine sandy loam or sandy clay loam.

Carbonates--Slightly to violently effervescent matrix with segregated lime as filaments, threads, or soft masses.

Consistence--Slightly plastic to plastic.

**Aqkb horizons:**

Hue--10YR, 2.5Y or 5Y

Value--5 or 6 dry.

Chroma--0 through 2.

Texture--Sandy loam, silty clay loam.

Structure--Platy, angular or subangular.

Consistence--Slightly plastic to plastic.

**C horizons:**

Hue--10YR, 2.5Y, 5Y or 5YR.

Value--5 or 6 dry.

Chroma--2 through 6.

Texture--Sandy loam, coarse sand, relict mottles.

Mottles--Relict mottles area in the lower part of the profile.

## Rustigate Series

The Rustigate series consists of very deep, somewhat poorly drained soils that formed in alluvium from mixed sources. Rustigate soils are on alluvial flats and axial stream terraces. Slopes are 0 to 2 percent. Mean annual precipitation is about 6 inches and the mean annual temperature is about 54 degrees F.

**Taxonomic class:** Fine-loamy, mixed (calcareous), mesic Oxyaquic Torriorthents

**Typical pedon:** Rustigate silt loam, in map unit 1492, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 4 inches; pale brown (10YR 6/3) silt loam, dark brown (10YR 3/3) moist; moderate medium to coarse platy structure; slightly hard, very friable, slightly sticky and nonplastic; many fine vesicular pores; violently effervescent; very strongly alkaline (pH 9.6); gradual smooth boundary.

C1--4 to 19 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; hard, friable, slightly sticky and slightly plastic; common fine roots; common fine tubular pores; violently effervescent; very strongly alkaline (pH 9.6); clear smooth boundary.

C2--19 to 26 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine roots; common fine tubular pores; violently effervescent; very strongly alkaline (pH 9.6); clear smooth boundary.

C3--26 to 42 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and nonplastic; common fine roots common fine tubular pores; violently effervescent; very strongly alkaline (pH 9.6); clear smooth boundary.

C4--42 to 60 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; distinct mottles; massive; slightly hard, very friable, slightly sticky and slightly plastic; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** 600 feet north of the southeast corner of section 31, T. 5 N., R. 48 E. (38 degrees, 14 minutes, 04 seconds north latitude; 116 degrees, 38 minutes, 17 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring, and for 10 to 20 days cumulative between July to October due to convection storms. Water table fluctuates between 36 to 60 inches in winter, spring and early summer.

*Soil temperature:* 53 to 59 degrees F.

*Control section:*

Clay content--Averages 18 to 27 percent.

*Carbonates:* Slightly effervescent to violently effervescent.

Reaction--Moderately alkaline to very strongly alkaline.

**A horizon:**

Value--6 through 8 dry, 3 through 6 moist.

Chroma--2 through 4.

**C horizons:**

Value--6 through 8 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Averages loam or sandy loam.

Consistence--Soft to hard, very friable to firm, nonsticky to slightly sticky and nonplastic to slightly plastic.

## Schwalbe Series

The Schwalbe series consists of moderately deep, well drained soils that formed in colluvium and residuum from volcanic rocks. The Schwalbe soils are on mountain and hill sideslopes. Slopes are 15 to 75 percent. The mean annual precipitation is about 11 inches and the mean annual air temperature is about 51 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Aridic Haploxerolls

**Typical pedon:** Schwalbe very stony fine sandy loam, in map unit 1050, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 5 percent stones, 15 percent cobbles, and 30 percent pebbles.

A1--0 to 4 inches; brown (10YR 5/3) very stony fine sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; many very fine and fine vesicular pores; 25 percent pebbles, 10 percent cobbles, and 5 percent stones; neutral (pH 6.8); clear smooth boundary.

A2--4 to 12 inches; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 30 percent pebbles and 10 percent cobbles; neutral (pH 6.8); clear smooth boundary.

Bw--12 to 22 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine through medium roots; common fine tubular pores; 45 percent pebbles, 10 percent cobbles, and 1 percent stones; mildly alkaline (pH 7.4) abrupt irregular boundary.

R--22 inches; extremely hard andesite bedrock.

**Type location:** 200 feet south and 600 feet east of the northwest corner of section 32, T. 8 N., R. 46 E. (39 degrees, 30 minutes, 23 seconds north latitude; 116 degrees, 50 minutes, 03 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Moist in winter and spring, dry in summer and fall except for 10 to 20 days cumulative July to October due to convection storms.

*Soil temperature:* 47 to 53 degrees F.

*Depth to bedrock:* 20 to 40 inches.

*Reaction:* Neutral or mildly alkaline.

*Mollic epipedon thickness:* 10 to 15 inches but does not include the Bw horizon.

*Control section:*

Clay content--6 to 18 percent.

Rock fragments--Averages 50 to 70 percent.

**A horizons:**

Value--4 or 5 dry, 2 or 3 moist

Chroma--2 or 3.

**Bw horizon:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture (less than 2mm.)--Loam, fine sandy loam or very fine sandy loam.

Consistence--Nonsticky to slightly sticky, nonplastic to slightly plastic.

## Settlemyer Series

The Settlemyer series consists of very deep, poorly drained soils that formed in alluvium from mixed rock sources. The Settlemyer soils are on stream terraces. Slopes are 0 to 4 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 45 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic  
Fluvaquentic Haplaquolls

**Typical pedon:** Settlemyer silt loam, in map unit 2410, meadow. (Colors are for dry soil unless otherwise noted.)

A1--0 to 3 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; weak medium granular structure; slightly hard, very friable, very sticky and very plastic; many very fine and medium roots; many very fine and fine interstitial pores; moderately alkaline (pH 8.4); slightly effervescent; abrupt smooth boundary.

A2--3 to 12 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; massive; hard, firm, sticky and plastic; many very fine and fine roots; common very fine and fine tubular pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

AC--12 to 20 inches; grayish brown (2.5Y 5/2) silty clay loam, moist; very dark grayish brown (2.5Y 3/2) moist; many medium distinct yellowish brown (10YR 5/4) mottles; massive; hard, firm, sticky and plastic; few very fine and few fine roots; common very fine and fine tubular pores; 10 percent pebbles; common fine white lime filaments and soft masses; moderately alkaline (pH 8.4); abrupt smooth boundary.

C--20 to 32 inches; light brownish gray (2.5Y 6/2) stratified clay to sandy loam, dark grayish brown (2.5Y 4/2) moist; common fine distinct yellowish brown (10YR 5/4) mottles; massive; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; many very fine and fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

2C1--32 to 44 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; many fine prominent mottles; massive; hard, firm, sticky and plastic; few very fine and fine roots; common very fine and fine tubular and interstitial pores; moderately alkaline (pH 8.2); clear smooth boundary.

2C2--44 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; common medium prominent mottles of strong brown (7.5YR 5/6) moist; massive; very hard, firm, sticky and plastic; few very fine and fine roots; moderately alkaline (pH 8.2).

**Type location:** 1,000 feet north and 1,700 feet east of the southwest corner of section 28, T. 15 N., R. 41 E. (39 degrees, 07 minutes, 55 seconds north latitude; 117 degrees, 22 minutes, 30 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Dry in mid summer and early fall, moist in late fall through early summer. Apparent seasonal water table is between 12 to 36 inches in winter and spring. Drained phases are recognized.

*Soil temperature:* 47 to 52 degrees F.

*Mollic epipedon thickness:* 12 to 24 inches.

*Sand fraction and pebble-sized fragments:* 15 to 30 percent fine sand or coarser particles.

*Profile reaction:* Neutral to very strongly alkaline. The higher reactions are only in sodium affected pedons.

*Control section:*

Clay content--25 to 35 percent, when mixed.

#### A and AC horizons:

Hue--2.5Y or 10YR.

Value--4 or 5 dry, 2 or 3 moist.

Chroma--1 through 3.

Effervescence--Noneffervescent or slightly effervescent in the upper part of the A horizon, but is not effervescent in all parts between 10 to 20 inches.

#### C horizons:

Hue--10YR, 2.5Y or 5Y.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--1 through 3.

Structure--Weak, medium and fine angular blocky or it is massive.

Texture--Very stratified clay, silty clay, silty clay loam, clay loam, loam, silt loam, or very fine sandy loam.

Consistence--Slightly hard or hard dry, friable to firm moist, nonsticky to sticky and nonplastic to plastic wet..

Mottles--Distinct or prominent redoximorphic features of reddish, greenish, or yellowish hues with chromas of 1 through 4, or the matrix has base colors indicative of gleying.

Other features--Some pedons have few small 1/4 or 3/4-inch lime concretions.

#### 2C horizons:

Effervescent--Noneffervescent or slightly effervescent.

## Sevenmile Series

The Sevenmile series consists of very deep, well drained soils that formed in mixed alluvium. Sevenmile soils are on inset fans and stream terraces. Slopes are 0 to 8 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 54 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Aridic Haploxerolls.

**Typical pedon:** Sevenmile fine sandy loam, in map unit 1551 rangeland. (Colors are for dry soils unless otherwise noted.)

A1--0 to 3 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; weak moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; few fine esicular pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

A2--3 to 7 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine and fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary.

Bw1--7 to 12 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine and fine tubular pores; 5 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary.

Bw2--12 to 34 inches; pale brown (10YR 6/3) gravelly fine loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine and fine tubular pores; 10 percent pebbles; mildly alkaline (pH 7.8); clear smooth boundary.

C1--34 to 47 inches; pale brown (10YR 6/3) stratified sandy loam to very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; common fine interstitial pores; 35 percent pebbles; mildly alkaline (pH 7.8); slightly effervescent; clear smooth boundary.

C2--47 to 60 inches; pale brown (10YR 6/3) stratified gravelly sandy loam to extremely gravelly loamy sand brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky to nonsticky and slightly plastic to nonplastic; few fine roots; many fine and medium interstitial pores; 50 percent pebbles; mildly alkaline (pH 7.8).

**Type location:** Nye County, Nevada, 150 feet south and 1,500 feet west of the north east corner of section 29, T. 8 N., R. 45 E. (38 degrees, 31 minutes, 09 seconds north latitude; 116 degrees, 56 minutes, 0 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Moist in winter and spring, dry in summer and fall except for 10 to 20 days cumulative July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Mollic epipedon thickness:** 10 to 16 inches.

**Reaction:** Slightly alkaline or moderately alkaline.

**Control section:**

Clay content--Averages 8 to 18 percent.

Rock fragments--Averages 10 to 35 percent.

#### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

Carbonates--Noneffervescent to strongly effervescent.

#### Bw horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Fine sandy loam, very fine sandy loam or loam.

Consistence--Soft or slightly hard, dry; very friable or friable, moist.

Carbonates--Noneffervescent to strongly effervescent.

#### C horizons:

Value--6 or 7 dry, 3 through 5 moist.

Chroma--3 or 4.

Texture--Stratified; dominated by fine sandy loam, sandy loam or very fine sandy loam but includes strata of loamy coarse sand to silt loam in some pedons.

Rock fragments--Averages 10 to 35 percent, mainly pebbles; individual strata range from 0 to 65 percent.

Structure--Subangular blocky or massive.

Consistence--Nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Carbonates--Slightly effervescent through violently effervescent.

## Shabliss Series

The Shabliss series consists of shallow over a duripan, well drained soils that formed in alluvium from mixed rock sources with a thin loess mantle high in volcanic ash. The Shabliss soils are on fan piedmont remnants. Slopes are 2 to 15 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haploxerollic Durorthids

**Typical pedon:** Shabliss gravelly loam, in map unit 2361, rangeland. (Colors are for dry soil unless otherwise noted). The surface is covered with 30 percent pebbles.

A1--0 to 2 inches; brown (10YR 5/3) gravelly loam, brown (10YR 4/3) moist; weak thin platy structure;

soft, very friable, nonsticky and nonplastic; many very fine interstitial pores; 20 percent pebbles; moderately alkaline (pH 8.3); abrupt smooth boundary.

A2--2 to 6 inches; light brownish gray (10YR 6/2) loam, brown (10YR 4/3) moist; weak thick platy structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; many very fine and fine vesicular pores; 10 percent pebbles; moderately alkaline (pH 8.3); abrupt smooth boundary.

Bw--6 to 12 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4); moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; strongly alkaline (pH 8.6); abrupt smooth boundary.

Bqkm--12 to 16 inches; light gray (10YR 7/2) strongly cemented duripan, brown (10YR 5/3) moist; strong medium platy structure; extremely hard, very firm; few very fine roots; few very fine interstitial and tubular pores; many fine white (10YR 8/2) lime laminae; many thin discontinuous silica laminae with some iron mottling on the surface; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary.

Bqk--16 to 44 inches; light gray (10YR 7/2) very gravelly loamy sand, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine interstitial and tubular pores; 40 percent pebbles; 10 percent extremely hard, very firm, brittle cemented lenses, 30 percent weakly lime and silica cemented lenses; 20 percent soft lime masses; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary.

2C--44 to 60 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine interstitial pores; 15 percent pebbles, 5 percent cobbles; strongly effervescent; very strongly alkaline (pH 9.4).

**Type location:** 100 feet north and 2,600 feet east of the southwest corner of section 16, T. 12 N., R. 47 E. (38 degrees 52 minutes, 18 seconds north latitude; 116 degrees, 41 minutes, 29 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist during winter and spring, dry summer through fall.

*Soil temperature:* 47 to 55 degrees F.

*Depth to base of Bw horizon:* 10 to 15 inches.

*Depth to strongly cemented duripan:* 10 to 20 inches.

*Depth to bedrock:* 60 inches or more.

*Control section:*

Clay content--5 to 15 percent.

Rock fragments--Averages 0 to 25 percent.

**A horizons:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

Other features--Some pedons have few fine soft pockets and films of lime and are violently effervescent.

**Bw horizon:**

Value--5 or 6 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Very fine sandy loam, silt loam or loam with thin subhorizons with fine sandy loam in some pedons.

Consistence--Soft or slightly hard, very friable to friable, nonsticky to slightly sticky and nonplastic to slightly plastic.

Reaction--Neutral to strongly alkaline.

Other features--Some pedons have few fine soft films of lime that are effervescent in pockets.

**Bqkm horizons:**

Structure--Platy or massive.

Consistence--Very hard or extremely hard.

Other features--In some pedons, 2 or more strongly cemented layers are interbedded with weakly cemented material.

Carbonates--Strongly effervescent to violently effervescent.

**Bqk horizons:**

Cementation--5 to 45 percent durinodes in a friable or brittle matrix.

Texture--Very fine sandy loam, loam or silt loam, with fine sandy loam layers in some pedons.

Structure--Subangular blocky or massive.

Consistence--Slightly hard or hard dry; very friable or friable moist.

**Bqk and C horizons:**

Clay content--0 to 10 percent.

Rock fragments--Some pedons are gravelly or very gravelly below the duripan.

Consistence--Soft to very hard, very friable to firm.

Reaction--Moderately alkaline to very strongly alkaline.

Cementation--The Bqk (when present below the duripan) horizons have 5 to 45 percent extremely hard, extremely firm, brittle 1/8 to 1/2 inch cylindrical durinodes in a friable or firm matrix or have a continuous brittle matrix.

## Silverbow Series

The Silverbow series consists of very shallow and shallow over an indurated duripan, well drained soils formed in colluvium and alluvium from basalt and

related rocks. Silverbow soils are on pediments and hills. Slopes are 8 to 30 percent. The mean annual precipitation is about 6 inches; the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Durargids

**Typical pedon:** Silverbow very stony fine sandy loam, in map unit 1146, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 5 percent stones, 30 percent cobbles, and 20 percent pebbles.

A--0 to 2 inches; pale brown (10YR 6/3) very stony fine sandy loam, brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; common fine roots; many very fine and fine vesicular pores; 5 percent stones, 25 percent cobbles, and 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bt--2 to 9 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots; common fine tubular pores; thin distinct clay films on faces of peds and in pores; 5 percent stones, 25 percent cobbles, and 20 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

Btk--9 to 12 inches; pale brown (10YR 6/3) very cobbly clay loam, brown (10YR 4/3) moist; strong fine subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common fine tubular pores; few thin clay films on faces of peds; 10 percent stones, 25 percent cobbles, and 20 percent pebbles; violently effervescent; common large faint light gray (10YR 7/2) soft lime segregations; strongly alkaline (pH 8.6); abrupt wavy boundary.

Bqkm1--12 to 19 inches; white (10YR 8/2) silica lime indurated duripan, light gray (10YR 7/2) moist; massive; extremely hard, extremely firm; few very fine roots in fractures of the duripan; upper surface is laminar; violently effervescent; strongly alkaline (pH 8.5); clear wavy boundary.

Bqkm2--19 to 36 inches; white (10YR 8/2) weakly silica-lime cemented colluvial stones and cobbles, light gray (10YR 7/2) moist; massive; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** 1,200 feet west and 800 feet south of the northeast corner of section 14, T. 7 N., R. 38 E. (38 degrees, 28 minutes, 27 seconds north latitude; 117 degrees, 39 minutes, 58 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to indurated pan:** 8 to 14 inches.

**Reaction:** Moderately alkaline or strongly alkaline.

**Other features:** Some pedons have strongly cemented layers below the indurated duripan.

**Control section:**

Clay content--20 to 35 percent.

Rock fragments--50 to 70 percent, dominantly stones or cobbles.

#### A horizon:

Value--5 or 6 dry, 3 or 4 moist. (Dark colors due to parent material)

Chroma--2 or 3.

Carbonates--None to strongly effervescent.

#### Bt horizon:

Hue--7.5YR or 10YR.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Clay loam or sandy clay loam.

Rock fragments--50 to 70 percent, dominantly stones or cobbles.

Carbonates--Slightly effervescent to strongly effervescent.

#### Btk horizon:

Value--5 or 6 dry, 3 through 5 moist.

Chroma--3 or 4.

Texture--Clay loam or sandy clay loam.

Rock fragments--50 to 70 percent, mainly cobbles or stones.

Carbonates--Slightly effervescent to violently effervescent. Lime occurs as soft masses or filaments and as concretions in some pedons.

## Singatse Series

The Singatse series consist of very shallow, somewhat excessively drained soils that formed in residuum and colluvium from rhyolite, andesite, dacite, and granite. Singatse soils are on side slopes of mountains and hills. Slopes are 8 to 50 percent. The mean annual precipitation is about 5 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Lithic Torriorthents

**Typical pedon:** Singatse very stony sandy loam, in map unit 1071, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25

percent pebbles, 20 percent cobbles and 3 percent stones.

A--0 to 2 inches; light gray (10YR 7/2) very stony sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many fine interstitial and few fine vesicular pores; 20 percent pebbles, 15 percent cobbles, 3 percent stones; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

C--2 to 10 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 40 percent pebbles, 15 percent cobbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2R--10 inches; rhyolite, upper 3 inches partially weathered.

**Type location:** 800 feet south and 1,600 feet west of the northeast corner of section 8, T. 12 N., R. 34 E. (38 degrees, 55 minutes, 31 seconds north latitude; 118 degrees, 10 minutes, 13 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist for short periods in winter and spring. Dry in early May through October.

*Soil temperature:* 49 to 54 degrees F.

*Depth to lithic contact:* 4 to 10 inches.

*Reaction:* Moderately alkaline or strongly alkaline.

*Control section:*

Clay content--5 to 15 percent.

Rock fragments--35 to 60 percent, mainly pebbles.

Calcium carbonate equivalent--less than 15 percent.

#### A horizon:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

#### C horizon:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Texture--Very gravelly loam or very gravelly sandy loam.

## Slaw Series

The Slaw series consists of very deep, well drained soils that formed in alluvium from mixed sources. Slaw soils are on alluvial flats. Slopes are 0 to 2 percent.

The mean annual precipitation is about 5 inches and the mean annual temperature is about 54 degrees F.

**Taxonomic class:** Fine-silty, mixed (calcareous), mesic Typic Torrifluvents

**Typical pedon:** Slaw silt loam, in map unit 1492, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 5 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; strong thick platy structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine vesicular pores; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C1--5 to 9 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine and medium roots; common fine tubular pores; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C2--9 to 21 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; common fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C3--21 to 45 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C4--45 to 60 inches; pale brown (10YR 6/3) stratified very fine sandy loam to silty clay, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky to nonsticky and slightly plastic to nonplastic; strongly effervescent; strongly alkaline (pH 8.6).

**Type location:** 900 feet south and 300 feet west of the northeast corner of section 19, T. 5 N., R. 48 E. (38 degrees, 15 minutes, 41 seconds, north latitude; 116 degrees, 39 minutes, 17 seconds, west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 57 degrees F.

*Calcium carbonate:* 1 to 4 percent.

*Organic matter:* Decrease irregularly with depth.

*Reaction:* Strongly alkaline or very strongly alkaline.

*Control section:*

Clay content--18 to 35 percent.

**A horizon:**

Value--6 or 7 dry, 4 through 6 moist.  
 Chroma--2 through 4.  
 Carbonates--Slightly effervescent to violently effervescent.

**C horizons:**

Hue--10YR or 2.5Y  
 Value--6 through 8 dry, 4 through 6 moist.  
 Chroma--2 through 4.  
 Texture--Averages silty clay loam or silt loam, ranges from very fine sandy loam to silty clay.  
 Structure--Subangular blocky, platy or is massive.  
 Consistence--Soft to hard dry, very friable to friable, nonsticky to sticky, nonplastic to plastic.  
 Relict mottles--Common in any subhorizon.

**Spasprey Series**

The Spasprey series consists of moderately deep over strongly cemented duripan, well drained soils that formed in alluvium from mixed rock sources. These soils are on alluvial fan piedmont remnants, alluvial fans and lake terraces. Slopes are 0 to 8 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Haploxerollic Durargids

**Typical pedon:** Spasprey gravelly fine sandy loam, in map unit 2291 rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 5 inches; brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate medium and thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine vesicular pores; 15 percent pebbles; neutral (pH 7.3); clear smooth boundary.

Bt--5 to 17 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; to weak medium angular blocky structure; hard, friable, sticky and plastic; common very fine, fine, and medium roots; common very fine, fine and medium tubular pores; common thin clay films on faces of peds and bridging mineral grains, and moderately thick clay films in pores; 5 percent pebbles; mildly alkaline (pH 7.5); clear smooth boundary.

Bqk--17 to 21 inches; very pale brown (10YR 7/4) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; few very fine, fine, and medium tubular pores; 10 percent pebbles; 10 percent durinodes and a few silica-cemented lamella; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bqkm--21 to 32 inches; very pale brown (10YR 7/3) strongly cemented duripan; extremely hard, brittle; violently effervescent; moderately alkaline (pH 8.2); clear irregular boundary.

Cqk--32 to 60 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, nonplastic and nonsticky; 10 percent pebbles; silica and lime coating rock fragments; strongly effervescent; moderately alkaline (pH 8.2).

**Type location:** 2,400 feet west and 1,800 feet north of the southwest corner of section 5, T. 14 N., R. 39 E. (39 degrees, 36 minutes, 26 seconds north latitude; 117 degrees, 37 minutes, 04 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part mid October thru mid June.

*Soil temperature:* 47 to 53 degrees F.

*Depth to base of Bt horizon:* 10 to 20 inches.

*Depth to strongly cemented duripan:* 20 to 30 inches.

**Control section:**

Clay content--20 to 35 percent, when mixed.

*Texture:* Clay loam, loam, or sandy clay loam in the upper part and sandy loam or loam in the lower part.

Sand content--More than 35 percent.

Rock fragments--Less than 10 percent.

**A horizon:**

Hue--2.5Y or 10YR.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Consistence--Nonsticky or slightly sticky and nonplastic or slightly plastic wet.

**Bt horizon:**

Hue--7.5YR, 10YR, or 2.5Y.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Sandy clay loam, loam or clay loam.

Rock fragments--Less than 10 percent.

Structure--Subangular blocky, angular blocky or prismatic.

Consistence--Slightly hard or hard, dry and sticky or very sticky and plastic or very plastic wet.

Reaction--Neutral or mildly alkaline.

**Bqk horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

**Bqkm horizon:**

Hue--2.5Y, 10YR, or 7.5YR.

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

**Cqk horizon:**

Value--4 or 5 moist.

Consistence--Slightly hard to hard, friable to firm.

E. (37 degrees, 58 minutes, 40 seconds north latitude; 116 degrees, 30 minutes, 27 seconds west longitude.)

**Squawtip Series**

The Squawtip series consists of moderately deep, well drained soils that formed in residuum and colluvium from volcanic rocks. Squawtip soils are on sideslopes of mountains and hills. Slopes are 15 to 75 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 44 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Typic Argixerolls

**Typical pedon:** Squawtip very stony loam, in map unit 1420, woodland. (Colors are for dry soil unless otherwise noted.) The surface is covered with about 15 percent pebbles, 30 percent cobbles, and 3 percent stones.

A1--0 to 2 inches; dark grayish brown (10YR 4/2) very stony loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many fine interstitial pores; 10 percent pebbles, 15 percent cobbles and 5 percent stones; slightly acid (pH 6.4); abrupt wavy boundary.

A2--2 to 5 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; 15 percent pebbles; neutral (pH 6.8); clear wavy boundary.

Bt1--5 to 11 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine to medium, common coarse roots; many very fine and fine tubular pores; few thin clay films on faces of peds, lining pores and coating rock fragments; 35 percent pebbles, 5 percent cobbles; neutral (pH 6.8); gradual wavy boundary.

Bt2--11 to 38 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; common very fine and fine tubular pores; common thin clay films on faces of peds, lining pores, and coating rock fragments; 25 percent pebbles, 20 percent cobbles; neutral (pH 7.0); clear wavy boundary.

Cr--38 inches; weathered andesitic tuff.

**Type location:** Nye County, Nevada, Kawich Range, Stone Cabin Valley, approximately 600 feet north of the southeast corner of section 33, T. 2 N., R. 49

**Range in characteristics:**

**Soil moisture:** Usually moist in winter and early spring, dry summer and fall, but moist intermittently, 10 to 20 days, during summer and fall due to convection storms; dry in all parts at least 45 consecutive days following the summer solstice.

**Soil temperature:** 43 to 47 degrees F.

**Depth to paralithic contact:** 20 to 40 inches.

**Depth to hard rock:** Greater than 40 inches.

**Mollic epipedon thickness:** 10 to 18 inches.

**Control section:**

Percent clay--18 to 25 percent.

Rock fragments--35 to 60 percent.

**A horizons:**

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

Reaction--Slightly acid or neutral.

**Bt horizons:**

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 through 4.

Texture--Loam, sandy loam or sandy clay loam.

Consistence--Soft to hard, very friable or friable.

Reaction--Neutral or mildly alkaline.

**Stargo Series**

The Stargo series consists of very deep, somewhat excessively drained soils that formed in alluvium from mixed rocks. Stargo soils are on alluvial flats and fan skirts. Slopes are 0 to 2 percent. The mean annual precipitation is about 6 inches; mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy, mixed, mesic Durorthidic Torrifluvents

**Typical pedon:** Stargo loam, in map unit 1242, rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 1 inch; light yellowish brown (10YR 6/4) loam, brown (10YR 4/3) moist; moderate coarse platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many fine and medium vesicular pores; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

A2--1 to 3 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; strong thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine, fine and

- medium vesicular pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.
- C1**--3 to 11 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate coarse subangular blocky parting to moderate medium platy structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; many very fine interstitial and tubular pores; many moderately thick clay coats on sand grains, few thin clay films in pores and on faces of peds; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.
- C2**--11 to 18 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine tubular pores; few thin clay films on faces of peds and lining pores; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- Cqk**--18 to 31 inches; very pale brown (10YR 7/3) loamy sand, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial and tubular pores; 20 percent silica and lime cemented durinodes to 1 cm. in diameter; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.
- 2C**--31 to 60 inches; pale brown (10YR 6/3) stratified loamy sand to very gravelly sand, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** 1,000 feet north and 800 feet east of the southwest corner of section 11, T. 4 N., R. 48 E. (38 degrees, 12 minutes, 24 seconds north latitude; 116 degrees, 34 minutes, 01 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms, otherwise dry.

**Soil temperature:** 53 to 59 degrees F.

**Reaction:** Mildly alkaline to strongly alkaline.

**Carbonates:** Noneffervescent to strongly effervescent.

**Organic matter:** Decreases irregularly with depth.

Value--6 or 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Organic matter--Highly irregular with depth.

**Control section:**

Texture--Averages loamy sand or sand, includes strata of sand, loamy sand, loamy fine sand, sandy loam, clay loam, coarse sandy loam, fine sandy loam.

Rock fragments--Average less than 15 percent, but thin strata of 15 to 55 percent pebbles in some pedons.

**C horizons:**

Structure--Prismatic, platy, subangular blocky, single grained or massive.

Consistence--Soft to slightly hard, very friable or friable, slightly sticky or sticky and slightly plastic or plastic.

**Cqk horizon:**

Consistence--Slightly hard to hard, very friable to friable.

Cementation--Cemented plates, discontinuous weak cementation or 20 to 40 percent durinodes.

**2C horizon:**

Structure--Single grained or massive.

Consistence--Loose or soft, loose or very friable.

## Stewval Series

The Stewval series consists of shallow and very shallow, well drained soils that formed in residuum and colluvium from rhyolite and related rock. Stewval series formed on hills, mountain slopes, mesas, plateaus and pediments. Slopes are 8 to 75 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 51 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Xerollic Haplargids

**Typical pedon:** Stewval very gravelly fine sandy loam, in map unit 1222, rangeland. (Colors are for dry soil unless otherwise noted.) Approximately 55 percent surface pebbles.

**A**--0 to 1 inch; brown (10YR 5/3) very gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and slightly plastic; few very fine roots; common very fine vesicular and many very fine and fine interstitial pores; 45 percent pebbles; slightly effervescent; mildly alkaline (pH 7.7); abrupt smooth boundary.

**Bt**--1 to 4 inches; brown (7.5YR 5/4) extremely gravelly loam, dark brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine interstitial pores; few thin clay films in pores; 70 percent pebbles; strongly effervescent; mildly alkaline (pH 7.7); abrupt irregular boundary.

**R**--4 inches; highly fractured, hard rhyolite; few very fine and fine roots in cracks; strongly effervescent, thin discontinuous silica and lime coatings in cracks; clear wavy boundary.

**Type location:** 400 feet south and 1,800 feet east of the northwest corner of section 33, T. 11 N., R. 36 E. (38 degrees, 46 minutes, 52 seconds north latitude; 117 degrees, 56 minutes, 15 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in winter and spring months, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to bedrock:* 4 to 14 inches.

*Carbonates:* Slightly effervescent to violently effervescent.

Reaction-- Mildly alkaline or moderately alkaline.

*Control section:*

Clay content--18 to 27 percent.

Rock fragments--35 to 70 percent pebbles, 0 to 10 percent cobbles, 0 to 15 percent stones. Some pedons have 0 to 5 percent flagstones.

**A horizon:**

Hue--10YR or 7.5YR.

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

**Bt horizon:**

Hue--10YR or 7.5YR or 5YR.

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture (less than 2mm)--Loam or clay loam.

Structure--Subangular blocky or granular.

Consistence--Soft or slightly hard.

Other features--Silica and lime pendants are present on rock fragments in some pedons.

## Stonell Series

The Stonell series consists of very deep, well drained soils that formed in alluvium from mixed rock sources including volcanic tuffs and sedimentary rocks. Stonell soils are on fan piedmont remnants. Slopes are 2 to 8 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Haplargids

**Typical pedon:** Stonell gravelly sandy loam, in map unit 1930, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with about 25 percent pebbles, 5 percent cobbles.

A1--0 to 2 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; medium fine platy structure; soft, very friable, slightly sticky and

slightly plastic; few very fine roots; common fine vesicular pores; 20 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

A2--2 to 3 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; medium fine platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine and fine vesicular pores; 15 percent pebbles; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

Btk--3 to 9 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; common moderately thick clay films on faces of peds and lining pores; thin lime and silica coating undersides of rock fragments; 40 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

Bqk1--9 to 19 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; thin lime and silica coating undersides of rock fragments; 40 percent pebbles; 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

Bqk2--19 to 28 inches; pale brown (10YR 6/3) finely stratified, very gravelly sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few fine roots; few fine tubular pores; thin lime and silica coating undersides of rock fragments; 40 percent pebbles; 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

Bqk3--28 to 60 inches; pale brown (10YR 6/3) stratified very gravelly sandy loam to very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine interstitial pores; thin lime and silica coating undersides of rock fragments; 50 percent pebbles; 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** 1,300 feet north and 1,300 feet west of the southeast corner of section 34 T. 1 N. R. 43 E. (37 degrees, 53 minutes, 31 seconds north latitude; 117 degrees, 08 minutes, 08 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry; moist in some part for short periods during the winter and early spring months and for 10 to 20 days cumulative due to summer convection storms.

*Soil temperature:* 53 to 59 degrees F.

**Carbonates:** Strongly effervescent or violently effervescent.

**Depth to lower boundary of Bt horizon:** 6 to 10 inches.

**Control section:**

Clay content--7 to 12 percent.

Rock fragments--35 to 55 percent; mostly pebbles.

**A horizons:**

Value--6 or 7 dry, 5 or 6 moist.

Chroma--2 through 4.

**Btk horizon:**

Hue--7.5YR or 10YR.

Value--6 or 7 dry, 4 through 6 moist.

Chroma--2 through 4.

Texture of fine earth--Sandy clay loam, clay loam or loam.

Percent clay--20 to 30 percent.

Rock fragments--35 to 60 percent mostly pebbles.

Structure--Subangular blocky or massive.

Reaction--Moderately alkaline or strongly alkaline.

**Bqk horizons:**

Value--6 through 8 dry, 4 through 6 moist.

Chroma--2 through 4.

Texture--Stratified very gravelly sandy loam to very gravelly loamy sand.

Clay content--5 to 10.

Reaction--Strongly alkaline or very strongly alkaline.

## Stumble Series

The Stumble series consists of very deep, somewhat excessively drained soils that formed in mixed sandy alluvium and eolian deposits. Stumble soils are on fan skirts, fan pediments, alluvial flats and sand sheets. Slopes are 0 to 15 percent. The mean annual precipitation is approximately 6 inches; and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Mixed, mesic Typic Torripsamments

**Typical pedon:** Stumble loamy sand, in map unit 1136 rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 1 inch; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; single grained; loose, nonsticky and nonplastic; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

A2--1 to 5 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; 5 percent pebbles; common fine roots; moderately alkaline (pH 8.0); clear smooth boundary.

Bw--5 to 12 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine

and fine, few medium and coarse roots; 10 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

C1--12 to 38 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium and coarse roots; 10 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C2--38 to 60 inches; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, few medium and coarse roots; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** 500 feet west and 400 feet north of the southeast corner of section 32, T. 3 N., R. 48 E. (38 degrees, 03 minutes, 38 seconds north latitude; 116 degrees, 37 minutes, 19 seconds west longitude.)

### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring, and for 10 to 20 day cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Substratum:** Finer textured layers are at depths below 40 inches in some pedons.

**Control section:**

Rock fragments--5 to 35 percent, dominantly pebbles in some horizon.

**A horizons:**

Value--6 or 7 dry, 4 or 5 moist.

Chromas--2 or 3.

Reaction--Neutral to moderately alkaline.

**Bw horizon:**

Chroma--2 or 3.

Consistence--Soft or slightly hard dry.

**C1 horizon:**

Hue--10YR or 2.5Y

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Structure--Single grained or it is massive.

Texture--Loamy sand or loamy fine sand, with strata of fine sand and sand.

Effervescence--Slightly effervescent to violently effervescent.

Structure--Single grained, subangular blocky or massive.

**C2 horizon:**

Carbonates--Slightly effervescent to violently effervescent.

Structure--Single grained, subangular blocky or massive.  
 Texture--Loamy sand or loamy fine sand with strata of fine sand and sand.  
 Reaction--Moderately alkaline or strongly alkaline.

## Suak Series

The Suak series consists of moderately deep, well drained soils that formed in residuum and colluvium from quartzite, conglomerate, sandstone, and mixed volcanic rocks. The Suak soils are on mountain side slopes. Slopes are 15 to 30 percent. The mean annual precipitation is about 14 inches and the mean annual temperature is about 42 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, frigid Typic Argixerolls

**Typical pedon:** Suak very stony loam, in map unit 1540, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 5 percent stones.

O--1 to 0 inches; mountain mahogany duff.

A1--0 to 2 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine roots; common fine interstitial pores, few fine tubular; 25 percent pebbles, 5 percent cobbles, 5 percent stones; neutral (pH 6.6); abrupt smooth boundary.

A2--2 to 8 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; few fine tubular pores; 30 percent pebbles, 10 percent cobbles; neutral (pH 6.6); clear smooth boundary.

Bt1--8 to 16 inches; pale brown (10YR 6/3) extremely cobbly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; few thin clay films on faces of peds and lining pores; 30 percent pebbles, 30 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary.

Bt2--16 to 25 inches; pale brown (10YR 6/3) extremely cobbly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; few thin clay films on faces of peds and lining pores; 30 percent pebbles, 30 percent cobbles; mildly alkaline (pH 7.4); clear smooth boundary.

R--25 inches; highly fractured bedrock.

**Type location:** 200 feet north and 200 feet east of the southwest corner of section 8, T. 1 N., R. 49 E. (37 degrees, 57 minutes, 03 seconds north latitude; 116 degrees, 30 minutes, 48 seconds west longitude.)

### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and early spring, dry from spring through fall.

*Soil temperature:* 42 to 47 degrees F.

*Mollic epipedon thickness:* 8 to 17 inches, includes the upper part of the Bt horizon.

*Depth to bedrock (lithic contact):* 20 to 40 inches.

### A horizons:

Value--4 or 5 dry, 2 or 3 moist.

Chroma--2 or 3.

### Bt horizons:

Value--4 through 6 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Extremely cobbly loam or extremely gravelly loam.

Clay content--20 to 27 percent.

Rock fragments--60 to 85 percent.

Consistence--Soft or slightly hard, dry; very friable to friable moist; slightly sticky to sticky and slightly plastic to plastic wet.

Other features--Some pedons have thin soft lime coatings on undersides of rock fragments.

## Terlco Series

The Terlco series consists of very deep, well drained soils that formed in mixed alluvium. Terlco soils are on fan piedmonts. Slopes are 2 to 30 percent. Mean annual precipitation is about 6 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Typic Natrargids

**Typical pedon:** Terlco very gravelly fine sandy loam, in map unit 1323, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 45 percent pebbles and 10 percent cobbles.

A--0 to 2 inches; light gray (10YR 7/2) very gravelly fine sandy loam, grayish brown (10YR 5/2) moist; moderate thin and medium platy structure; slightly hard, very friable, nonsticky and slightly plastic; many very fine and fine vesicular and few very fine and fine interstitial pores; 35 percent pebbles; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

Btn--2 to 7 inches; very pale brown (10YR 7/4) gravelly clay loam, yellowish brown (10YR 5/4) moist; strong medium and coarse prismatic

structure; hard, firm, sticky and plastic; common fine roots; many fine and medium tubular pores; many moderately thick and thick clay films on peds and lining pores; 15 percent pebbles; slightly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

**Btkn--7 to 11 inches;** very pale brown (10YR 7/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, slightly sticky and plastic; few coarse and many very fine, fine and medium roots; many fine and medium tubular pores; common thin clay films on peds and lining pores; 30 percent pebbles; strongly effervescent; very strongly alkaline (pH 9.4); clear wavy boundary.

**Bk1--11 to 18 inches;** very pale brown (10YR 8/3) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; common fine interstitial pores; 40 percent pebbles, 5 percent cobbles; common soft lime masses; violently effervescent; very strongly alkaline (pH 9.4); clear wavy boundary.

**2Bk2--18 to 26 inches;** white (10YR 8/2) very gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine and fine roots; few fine interstitial pores; 45 percent pebbles, 10 percent cobbles; common soft lime masses; violently effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

**2Bk3--26 to 33 inches;** light gray (10YR 7/2) very gravelly loamy sand, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine interstitial pores; 45 percent pebbles, 5 percent cobbles; common thin lime coating undersides of rock fragments; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

**2Bk4--33 to 60 inches;** white (10YR 8/2) very gravelly loamy sand, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine interstitial pores; 50 percent pebbles; common moderately thick lime coating underside of rock fragments; violently effervescent; very strongly alkaline (pH 9.4).

**Type location:** 300 feet west and 700 feet south of the northwest corner of section 34, T. 11 N., R. 35 E. (38 degrees, 46 minutes, 53 seconds north latitude; 118 degrees, 02 minutes, 08 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to bottom of natric horizon:** 10 to 18 inches.

**Carbonates:** Slightly effervescent to violently effervescent, major accumulation of carbonates are in bands or pockets in some pedons.

**Reaction:** Moderately alkaline to very strongly alkaline

**Control section:**

Percent clay--18 to 35.

Rock fragments--15 to 30 percent pebbles.

#### A horizon:

Value--6 through 8 dry, 3 through 6 moist.

Chroma--2 or 3.

#### Btn and Btkn horizons:

Value--5 through 7 dry, 4 through 6 moist.

Chroma--3 or 4.

Texture (less than 2 millimeter fraction)--Clay loam, loam, or sandy loam. Subhorizons of sandy clay are in some pedons.

Structure--Platy to prismatic may part to angular or subangular blocky.

Consistence--Slightly hard to very hard, dry; very friable to firm, moist; slightly sticky or sticky wet.

Clay content--18 to 35 percent. Clay content is up to 40 percent in the upper part of the argillic in some pedons.

Carbonate accumulates in the lower part of the argillic.

Sodium adsorption ratio--13 to 30.

#### 2Bk horizons:

Value--5 through 8 dry, 4 through 7 moist.

Chroma--2 through 4.

Texture less than 2 mm--Loamy sand or sand.

Clay content--3 to 10.

Rock fragments--35 to 60 percent pebbles, 0 to 20 percent cobbles.

Consistence--Soft to slightly hard, very friable to friable.

Sodium absorption ratio--31 to 45

## Tert Series

The Tert series consists of very shallow, well drained soils that formed in residuum from tertiary lacustrine sedimentary rocks. The Tert soils are on pediment remnants. Slopes are 8 to 30 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents.

**Typical pedon:** Tert loam, in map unit 2120, rangeland. (Colors are for dry soil unless otherwise noted.)

A--0 to 5 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; strong moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine interstitial pores; 10 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Cr1--5 to 8 inches; highly weathered and fractured bedrock; works up to a loam; many very fine and common medium roots along fractures; moderately alkaline (pH 8.2); abrupt clear boundary.

Cr2--8 to 60 inches; consolidated fractured lacustrine sediments; common medium roots in cracks.

**Type location:** 2,000 feet south and 1,700 feet west of the northeast corner of section 6, T. 9 N., R. 37 E. (38 degrees, 40 minutes, 08 seconds north latitude; 117 degrees, 53 minutes, 59 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Moist in winter and spring, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 54 to 59 degrees F.

*Depth to paralithic:* 4 to 7 inches.

*Effervescence:* Strongly effervescent or violently effervescent.

**Control section:**

Clay content--18 to 27 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

**A horizon:**

Hue--2.5Y or 10YR.

Value--5 or 6 dry and moist.

Chroma--2 through 4 dry and moist.

Other features--A surface crust of about 1/4 inch thick is on some pedons.

## Theon Series

The Theon series consists of very shallow and shallow, well drained soils formed in residuum and colluvium from andesite, rhyolite and quartzite. Theon soils are on side slopes and crests of hills. Slopes are 8 to 50 percent. The mean annual precipitation is about 5 inches and the mean annual temperature is about 50 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Haplargids

**Typical pedon:** Theon very gravelly sandy loam, in map unit 1071, rangeland. (Colors are for dry soil unless otherwise noted). The surface is covered with 40 percent pebbles and 10 percent cobbles.

A--0 to 3 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; common very fine and fine vesicular pores, few fine tubular pores; 30 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bt1--3 to 5 inches; brown (10YR 5/3) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; many very fine, few fine, and medium tubular pores; 40 percent pebbles, 5 percent cobbles; many moderately thick clay films in pores and on faces of peds; moderately alkaline (pH 8.4); abrupt wavy boundary.

Bt2--5 to 11 inches; brown (10YR 5/3) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; common very fine and fine roots; common very fine, few fine, and medium tubular pores; 40 percent pebbles, 5 percent cobbles; common moderately thick and thin clay films in pores and on faces of peds; moderately alkaline (pH 8.4); abrupt wavy boundary.

R--11 inches; fractured andesite, upper two inches weathered.

**Type location:** 2,200 feet east and 2,600 feet south of the northwest corner of section 17, T. 12 N., R. 34 E. (38 degrees, 54 minutes, 20 seconds north latitude; 118 degrees, 10 minutes, 32 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist for short periods in winter and spring, dry late May through November.

*Soil temperature:* 53 to 59 degrees F.

*Combined thickness of A and Bt horizons:* 8 to 14 inches.

*Depth to lithic contact:* 8 to 14 inches.

**Control section:**

Clay content--25 to 35 percent.

Rock fragments--35 to 60 percent, mainly pebbles.

**A horizon:**

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Rock fragments--35 to 80 percent.

Reaction--Neutral through moderately alkaline.

Effervescence--Slightly effervescent due to recharge from dust in some pedons.

**Bt horizons:**

Hue--10YR, 7.5YR or 5YR.

Value--4 through 7 dry; 3 through 5 moist.

Chroma--3 or 4.

Texture--Very gravelly clay loam, very gravelly sandy clay loam, or very gravelly loam.

Subhorizons of some pedons are extremely gravelly.

Structure--Angular blocky or subangular blocky.

Consistence--Slightly hard to hard dry, very friable to firm moist, slightly sticky to sticky and slightly plastic to plastic wet.

Reaction--Neutral to strongly alkaline.

#### R horizon:

Other features--Some pedons have discontinuous thin coats of silica or silica and lime along weak fracture planes.

## Tognoni Series

The Tognoni series consists of very shallow and shallow, well drained soils that formed in residuum and colluvium from basalt. Tognoni soils are on mesas, plateaus, and hills. Slopes are 2 to 50 percent. Mean annual precipitation is about 6 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Lithic Haplargids

**Typical pedon:** Tognoni very cobbly fine sandy loam, in map unit 1851, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 20 percent pebbles and 20 percent cobbles.

A1--0 to 2 inches; pale brown (10YR 6/3) very cobbly fine sandy loam, brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 25 percent pebbles, 15 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

A2--2 to 5 inches; pale brown (10YR 6/3) very cobbly fine sandy loam, brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine vesicular and tubular pores; 20 percent pebbles, 15 percent cobbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bt1--5 to 8 inches; yellowish brown (10YR 5/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine, few medium roots; many very fine tubular pores; common moderately thick clay films lining pores; few thin clay films on

faces of peds; 25 percent pebbles, 20 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bt2--8 to 12 inches; yellowish brown (10YR 5/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, very friable, sticky and plastic; common very fine and fine roots; common very fine tubular pores; common moderately thick clay films on faces of peds and lining pores; 20 percent pebbles, 25 percent cobbles; common moderately thick silica and lime pendants on rock fragments in the lower part of the horizon; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

R--12 inches; fractured basalt, very thin discontinuous silica-lime laminar cap and coatings in fractures.

**Type location:** 2,000 feet south and 1,000 feet east of the northwest corner of section 34, T. 4 N., R. 43 E. (38 degrees, 09 minutes, 32 seconds north latitude; 117 degrees, 08 minutes, 28 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry. Moist in some part for short periods winter and early spring and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 57 degrees F.

**Depth to bedrock:** 5 to 14 inches.

**Reaction:** Moderately alkaline or strongly alkaline.

**Control section:**

Percent clay--27 to 35 percent.

Rock fragments--45 to 70 percent.

#### A horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Carbonates--Slightly effervescent to violently effervescent.

Lower boundary--Abrupt or very abrupt.

#### Bt horizons:

Hue--10YR or 7.5YR.

Value--4 or 5 dry, 3 or 4 moist.

Chroma--3 or 4.

Texture--Clay loam or clay. Subhorizons of clay loam are in some pedons.

Clay content--Averages 35 to 45 percent clay.

Rock fragments--45 to 70 percent, dominantly cobbles.

Structure--Subangular blocky or granular.

Consistence--Soft to hard, very friable to friable, slightly sticky to sticky, slightly plastic to plastic.

Carbonates--Slightly effervescent or noneffervescent.

Other features--Silica and lime pendants are common in the lower part in most pedons.

## Unius Series

The Unius series consists of shallow, over a strongly cemented duripan, well drained soils formed in mixed alluvium from volcanic and sedimentary rock sources with a component of loess and volcanic ash. The Unius soils are on fan piedmont remnants. Slopes are 2 to 15 percent. The mean annual precipitation is about 10 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haploxerollic Durorthids

**Typical pedon:** Unius gravelly silt loam, in map unit 2241, rangeland. (Colors are for dry soils unless otherwise noted.) The soil surface is partially covered with 50 percent pebbles.

A1--0 to 2 inches; pale brown (10YR 6/3) gravelly silt loam, brown (10YR 4/3) moist; moderate thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; very few very fine and fine roots; common very fine and fine vesicular pores; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

A2--2 to 5 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, friable, sticky and plastic; few medium and common very fine and fine roots; common very fine and fine vesicular pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bw--5 to 11 inches; light yellowish brown (10YR 6/4) silt loam, dark yellowish brown (10YR 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and fine roots; common very fine interstitial pores; 10 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

Bqkm--11 to 24 inches; white (10YR 8/2) strongly cemented duripan with discontinuous silica lamanaea, light brownish gray (10YR 6/2) moist; massive; very hard, very firm, brittle; very few very fine roots; very few very fine interstitial pores; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

Cqk--24 to 54 inches; white (10YR 8/2) gravelly loamy sand very pale brown (10YR 7/3) moist; massive; hard, firm, nonsticky and nonplastic; discontinuous strongly silica and lime cemented layers; 25 percent pebbles, 5 percent cobbles; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

2Ck--54 to 60 inches; very pale brown (10YR 7/3) gravelly loamy sand, pale brown (10YR 6/3) moist; single grained; loose, nonsticky and nonplastic; 20 percent pebbles; common thin lime coating rock

fragments; strongly effervescent; moderately alkaline (pH 8.2)

**Type location:** 1,000 feet south and 2,200 feet east of the northwest corner of section 21, T. 14 N., R. 47 E. (39 degrees, 02 minutes, 26 seconds north latitude; 116 degrees, 41 minutes, 03 seconds west longitude.)

### Range in characteristics:

**Soil moisture:** Moist in some part from November through May, dry from June to October.

**Soil temperature:** 47 to 52 degrees F.

**Depth to duripan:** 10 to 20 inches.

**Reaction of profile:** Mildly alkaline through strongly alkaline.

**Carbonates:** 5 to 15 percent calcium carbonate equivalent throughout the soil profile.

**Control section:**

Clay content--Averages 18 to 25 percent.

Rock fragments--0 to 25 percent pebbles and duripan fragments.

### A horizons:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Effervescence--Slightly effervescent or strongly effervescent.

### Bw horizon:

Value--5 through 6 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Silt loam, loam.

Consistence--Very friable to friable.

Rock fragments--0 to 10 percent.

### Bqkm horizon:

Value--6 through 8 dry, 5 or 6 moist.

Chroma--2 through 4.

Cementation--Strongly cemented horizons stratified with weakly cemented layers.

### 2Ck horizon:

Rock fragments--15 to 30 percent pebbles.

## Univega Series

The Univega series consists of very shallow and shallow over an indurated duripan, well drained soils. The soils formed in mixed alluvium from quartzite and volcanic sources. Univega soils are on fan piedmonts. Slopes are 2 to 15 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Typic Durorthids

**Typical pedon:** Univega gravelly fine sand, in map unit 1092, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 30 percent pebbles.

A1--0 to 1 inch; light brownish gray (10YR 6/2) gravelly fine sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; few fine interstitial pores; 25 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

A2--1 to 4 inches; very pale brown (10YR 7/3) fine sandy loam, brown (10YR 4/3) moist; weak fine platy structure parting to weak fine subangular blocky; soft, very friable, nonsticky and nonplastic; common very fine and medium, few coarse roots; common fine tubular pores; 5 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bw--4 to 13 inches; very pale brown (10YR 7/3) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and medium, few coarse roots; common fine tubular pores; 5 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

2Bqkm1--13 to 18 inches; white (10YR 8/1) fractured, indurated duripan, light gray (10YR 7/2) moist; massive; very hard, few fine roots in fractures; interbedded strong to weak cementation within indurated lamella, violently effervescent; clear wavy boundary.

2Bqkm2--18 to 42 inches; white (10YR 8/1) indurated duripan, light gray (10YR 7/2) moist; massive; very hard; violently effervescent; gradual wavy boundary.

3Bqk--42 to 60 inches; white (10YR 8/1) gravelly coarse sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; few fine interstitial pores; 20 percent pebbles; common moderately thick lime and silica pendants on underside of rock fragments; violently effervescent; strongly alkaline (pH 8.6.)

**Type location:** 2,000 feet south and 2,500 feet west of the northeast corner of section 14, T. 2 N., R. 47 E. (38 degrees, 01 minutes, 28 seconds north latitude; 116 degrees, 40 minutes, 58 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some parts in winter and early spring and for 10 to 20 days in the upper part of the profile during July to September following convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to duripan:** 8 to 20 inches.

Reaction--Moderately alkaline or strongly alkaline.

#### A horizons:

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3 dry and moist.

#### Bw horizon:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4 dry and moist.

Consistence--Nonsticky to slightly sticky.

Structure--Platy or subangular blocky.

Texture--Fine sandy loam, sandy loam.

Clay content--8 to 18 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

#### Bqkm horizons:

Silica cementation--Interbedded strong and weak cementation with thin continuous indurated laminae.

#### Bqk horizon:

Value--7 or 8 dry, 6 or 7 moist.

Chroma--1 or 2 dry, 3 or 4 moist.

Texture--Coarse sand or sand.

Rock fragments--15 to 35 percent, mostly pebbles.

## Unsel Series

The Unsel series consists of very deep, well drained soils that formed in mixed alluvium. Unsel soils are on fan piedmont remnants. Slopes are 0 to 30 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is 53 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Haplargids

**Typical pedon:** Unsel gravelly sandy loam, in map unit 1130, rangeland. (Colors are for dry soil unless otherwise indicated.) The surface is covered with 30 percent pebbles.

A1--0 to 1 inch; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine platy structure; soft, very friable, nonsticky and nonplastic; 25 percent pebbles; moderately alkaline (pH 8.2); abrupt smooth boundary.

A2--1 to 3 inches; light gray (10YR 7/2) gravelly sandy loam, brown (10YR 5/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many fine and medium vesicular pores; 20 percent pebbles; moderately alkaline (pH 8.2); abrupt smooth boundary.

Bt--3 to 7 inches; pale brown (10YR 6/3) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; common moderately

thick clay films lining pores and on faces of peds; 20 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

**Btk**--7 to 15 inches; pale brown (10YR 6/3) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; common fine and medium tubular pores; common moderately thick clay films lining pores and on faces of peds; 30 percent pebbles; common soft lime masses; slightly to strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

**Bqk**--15 to 28 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; hard, firm, nonsticky and nonplastic; few fine roots; 30 percent pebbles; 45 percent discontinuous strongly lime and silica cemented strata, brittle matrix; violently effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary.

**2C**--28 to 60 inches; very pale brown (10YR 7/3) very gravelly loamy sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; 50 percent pebbles, 5 percent cobbles; strongly effervescent; strongly alkaline (pH 8.8).

**Type location:** 400 feet south and 600 feet east of the northwest corner of section 13, T. 3 N., R. 48 E. (38 degrees, 06 minutes, 52 seconds north latitude; 116 degrees, 33 minutes, 47 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winters and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to Bqk horizon:** 10 to 22 inches.

**Depth to 2C horizon:** 20 to 36 inches.

**Carbonates:** Noneffervescent to violently effervescent.

**Control section:**

Clay content--27 to 35 percent.

Rock fragments--15 to 30 percent.

#### A horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4 dry or moist.

Reaction--Moderately alkaline to very strongly alkaline.

#### Bt and Btk horizons:

Value--5 through 7 dry; 3 through 6 moist.

Chroma--2 through 4.

Texture of the fine earth--Clay loam or sandy clay loam.

Rock fragments--15 to 30 percent.

Structure--Weak or moderate, fine or medium subangular blocky, and weak medium or coarse prismatic structure but some are massive.

Consistence--Slightly hard or hard dry, very friable or very firm moist, slightly sticky to sticky and slightly plastic to plastic.

Reaction--Mildly alkaline to strongly alkaline.

#### Bqk horizon:

Value--6 through 8 dry; 4 through 6 moist.

Chroma--2 through 4.

Texture--Sandy loam, loam or sandy clay loam.

Rock fragments--15 to 35 percent.

Consistence--Soft to hard, very friable to firm, nonsticky or slightly sticky and nonplastic or slightly plastic.

#### 2C horizon:

Value--6 through 8 dry, 3 through 5 moist.

Chroma--2 through 4.

Consistence--Soft or slightly hard, very friable or friable.

Rock fragments--50 to 70 percent.

Other features--20 to 65 percent discontinuous strong silica and lime cementation.

## Uripnes Series

The Uripnes series consists of very shallow, well drained soils that formed in residuum weathered from granodiorite. Uripnes soils are on sideslopes of mountains. Slopes are 30 to 75 percent. The mean annual precipitation is about 6 inches and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, nonacid, mesic, shallow Typic Torriorthents.

**Typical pedon:** Uripnes very stony sandy loam, in map unit 1680, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 20 percent pebbles, 20 percent cobbles, and 10 percent stones.

**A1**--0 to 3 inches; pale brown (10YR 6/3) very stony sandy loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; few fine interstitial pores; 20 percent pebbles, 10 percent cobbles, 10 percent stones; neutral (pH 7.3); clear smooth boundary.

**A2**--3 to 7 inches; pale brown (10YR 6/3) very stony sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; few fine interstitial pores; 15 percent pebbles, 10 percent cobbles, 10 percent stones; neutral (pH 7.3); clear wavy boundary.

Cr--7 to 21 inches; weathered granodiorite and diorite with few roots in fractures.

R--21 inches; hard granodiorite

**Type location:** 1,500 feet north and 50 feet east of the southwest corner of section 33, T. 13 N., R. 34 E. (38 degrees, 56 minutes, 47 seconds north latitude; 118 degrees 09 minutes, 45 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist for short periods in winter, spring, summer, and autumn.

*Soil temperature:* 47 to 54 degrees F.

*Depth to weathered bedrock:* 4 to 9 inches to paralithic contact.

*Depth to unweathered bedrock:* 20 to 40 inches.

#### Control section:

Clay content--5 to 18 percent.

Rock fragments--35 to 60 percent, dominantly fine pebbles with cobbles and stones common.

Reaction--Slightly acid to mildly alkaline. Some pedons are moderately alkaline and have lime coats on the undersides of pebbles in the lower part of the profile.

#### A horizons:

Value--5 through 7 dry, 3 through 5 moist. When darker colors are present, they reflect the colors of the parent material.

Chroma--2 or 3, dry or moist.

#### Cr horizon:

Value--5 through 7 dry; 3 through 5 moist.

Chroma--2 or 3 dry or moist.

Other features--Some pedons have a thin C horizon above the Cr horizon.

Texture--Fine earth fraction is sandy loam or coarse sandy loam.

## Veet Series

The Veet series consists of very deep, well drained soils formed in mixed alluvium from andesitic and granitic rocks. Veet soils are on inset fans, alluvial fans, fan piedmonts and fan skirts. Slopes are 2 to 8 percent. The mean annual precipitation is about 9 inches, and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Xerollic Camborthids

**Typical pedon:** Veet very gravelly sandy loam, in map unit 1845, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 35 percent pebbles and 10 percent cobbles.

A--0 to 5 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft very friable, nonsticky and nonplastic; few medium and coarse and many very fine and fine roots; many very fine and fine interstitial pores; 25 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bw--5 to 20 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common coarse and many very fine, fine, and medium roots; many very fine and fine interstitial pores; 30 percent pebbles, 15 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary.

Bk1--20 to 35 inches; very pale brown (10YR 7/3) finely stratified extremely gravelly coarse sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine and medium roots; many very fine and fine interstitial pores; 50 percent pebbles, 10 percent cobbles, 5 percent stones; common thin carbonate pendants on bottom of cobbles and pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk2--35 to 60 inches; very pale brown (10YR 7/3) finely stratified very gravelly loamy coarse sand, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky, and nonplastic; few fine and medium roots; many very fine and fine interstitial pores; 30 percent pebbles, 5 percent cobbles, 5 percent stones; common thin carbonate pendants on bottom of cobbles and pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** 2,000 feet south and 100 feet west of the northeast corner of section 8, T. 12 N., R. 37 E. (38 degrees, 55 minutes, 08 seconds north latitude; 117 degrees, 50 minutes, 01 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in winter and spring months, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to lime:* 10 to 20 inches.

#### Control section:

Clay content--8 to 15 percent.

Rock fragments--35 to 65 percent.

#### A horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Slightly alkaline through strongly alkaline.

Carbonates--Noneffervescent or slightly effervescent.

**Bw horizon:**

Value--5 or 6 dry, 3 or 4 moist.  
 Chroma--2 through 4.  
 Structure--Weak or moderate, fine or medium subangular blocky.  
 Consistence--Soft or slightly hard, nonsticky or slightly sticky nonplastic or slightly plastic.  
 Reaction--Slightly alkaline through strongly alkaline.  
 Carbonates--Noneffervescent or slightly effervescent.

**Bk horizons:**

Value--5 through 7 dry, 4 or 5 moist.  
 Chroma--2 through 4.  
 Structure--Massive and subangular blocky.  
 Texture--Stratified extremely gravelly sandy loam to very gravelly loamy coarse sand.  
 Consistence--Soft or slightly hard, nonsticky or slightly sticky nonplastic or slightly plastic.  
 Reaction--Moderately alkaline or strongly alkaline.  
 Carbonates--Strongly effervescent or violently effervescent.  
 Other Features--Very thin lime coatings on the undersides of rock fragments.

**Vigus Series**

The Vigus series consists of very deep, well drained soils that formed in mixed alluvium. Vigus soils are on fan piedmonts. Slopes are 2 to 4 percent. Mean annual precipitation is about 6 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic Duric Haplargids

**Typical pedon:** Vigus gravelly loamy sand, in map unit 1061, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 30 percent pebbles.

- A1--0 to 1 inch; light gray (10YR 7/2) gravelly loamy sand, brown (10YR 5/3); single grained, loose, nonsticky, nonplastic; many fine interstitial pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.
- A2--1 to 4 inches; light gray (10YR 7/2) gravelly loamy sand, brown (10YR 5/3) moist; moderate coarse platy structure; slightly hard, very friable, nonsticky, nonplastic; few fine and medium roots; many fine vesicular pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
- Bt1--4 to 8 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; slightly hard, friable, sticky, plastic; many fine and medium roots; few medium

- and fine tubular pores; 10 percent pebbles; common thin and moderately thick clay films on faces of peds and in pores; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- Bt2--8 to 11 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak coarse prismatic parting to moderate fine subangular blocky; hard, firm, slightly sticky, nonplastic; many medium and fine roots; few medium and fine tubular pores; 15 percent pebbles; few thin clay films on faces of peds; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- 2Bq--11 to 14 inches; very pale brown (10YR 7/3) gravelly loamy sand, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky, nonplastic; many medium and fine roots; common fine interstitial pores; 20 percent pebbles, 5 percent cobbles; discontinuous strong silica and lime cementation; 35 percent hard durinodes; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.
- 3Bqk1--14 to 41 inches; very pale brown (10YR 7/3) finely stratified gravelly loamy sand; brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky, nonplastic; few coarse and common medium roots; common fine interstitial pores; 25 percent pebbles, 5 percent cobbles; discontinuous strong silica and lime cementation; 35 percent hard durinodes; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.
- 3Bqk2--41 to 60 inches; very pale brown (10YR 7/3) finely stratified gravelly sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, nonsticky, nonplastic; common fine interstitial pores; 15 percent pebbles; discontinuous strong silica-lime cementation; violently effervescent; strongly alkaline (pH 8.6).

**Type location:** 2,400 feet north and 1,800 feet east of the southwest corner of section 6, T. 12 N., R. 35 E. (38 degrees, 55 minutes, 58 seconds north latitude; 118 degrees, 9 minutes, 54 seconds west longitude.)

**Range in characteristics:**

- Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.
- Soil temperature:** 54 to 59 degrees F.
- Depth to durinodes:** 10 to 24 inches.
- Control section:**  
 Clay content--Averages 18 to 27 percent.  
 Rock fragments--Less than 15 percent

**A horizons:**

Value--6 or 7 dry, 3 through 5 moist.  
 Chroma--2 or 3.

Carbonates--Commonly noneffervescent, but is slightly effervescent in some pedons.  
Reaction--Neutral to moderately alkaline.

**Bt horizons:**

Value--5 or 6 dry, 4 or 5 moist.  
Chroma--2 through 4.  
Structure--Columnar, subangular blocky or prismatic.  
Consistence--Slightly hard to hard, very friable to firm, slightly sticky to sticky, nonplastic to plastic.  
Reaction--Moderately alkaline or strongly alkaline.  
Texture--Fine sandy loam, loam or sandy clay loam.

**Bq and Bqk horizons:**

Value--5 through 7 dry, 4 through 6 moist.  
Chroma--2 through 4.  
Consistence--Soft or slightly hard and friable in the horizon with durinodes.  
Durinodes--Hard and very hard, firm or very firm.  
Reaction--Moderately alkaline to very strongly alkaline.  
Rock fragments--Less than 30 percent.  
Substratum--A strongly cemented duripan is below 40 inches in some pedons.  
Other features--2Bk horizon is present in some pedons.

**Vindicator Series**

The Vindicator series consists of shallow and very shallow, well drained soils that formed in residuum and colluvium from volcanic rocks. Vindicator soils are on hills and pediments. Slopes are 8 to 30 percent. Mean annual precipitation is about 7 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Typic Haplargids

**Typical pedon:** Vindicator gravelly sandy loam, in map unit 1760, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 30 percent pebbles and 5 percent cobbles.

A--0 to 4 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine and fine interstitial pores; 25 percent pebbles, 5 percent cobbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bt--4 to 14 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots;

many very fine and fine interstitial pores; 40 percent pebbles; 5 percent cobbles; common thin clay films on faces of peds and lining pores; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr--14 inches; fractured rhyolite; roots extend into numerous fractures.

**Type location:** 1,800 feet east and 1,000 feet south of the northwest corner of section 20, T. 13 N., R. 37 E. (38 degrees, 58 minutes, 51 seconds north latitude; 117 degrees, 50 minutes, 39 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in some part for short periods during winter and early spring and for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to soft rock:* 4 to 14 inches.

*Reaction:* Mildly alkaline or moderately alkaline.

*Carbonates:* Slightly effervescent to violently effervescent.

*Control section:*

Clay content--18 to 27 percent.

Rock fragments--35 to 50 percent, mainly pebbles.

**A horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

**Bt horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Clay loam or loam.

Clay content--20 to 30 percent.

Consistence--Soft or slightly hard, very friable or friable, nonplastic to plastic.

Rock fragments--35 to 50 percent, mainly pebbles.

Other features--Normally contains 5 to 15 percent soft rock fragments that break down when shaken in water.

**Vinini Series**

The Vinini series consists of very shallow and shallow to an indurated duripan, well drained soils that formed in residuum and colluvium from volcanic rocks. Vinini soils are on mesas and plateaus. Slopes are 2 to 15 percent. Mean annual precipitation is about 9 inches and the mean annual air temperature is about 53 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic, shallow Xerollic Durargids

**Typical pedon:** Vinini very stony fine sandy loam, in map unit 1620, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered by 45 percent pebbles, 20 percent cobbles and 3 percent stones

A--0 to 2 inch; grayish brown (10YR 5/2) very stony fine sandy loam, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky, and nonplastic; few very fine roots; many very fine interstitial pores; 20 percent pebbles, 10 percent cobbles, 3 percent stones; mildly alkaline (pH 7.6); abrupt smooth boundary. (1/2 to 3 inches thick)

Bt--2 to 7 inches; brown (10YR 5/3) very gravelly clay loam, brown (10YR 4/3) moist; strong very fine subangular and angular blocky structure; slightly hard, friable, sticky and plastic; common fine tubular pores; 35 percent pebbles, 10 percent cobbles; many thin clay films on faces of peds and in pores; moderately alkaline (pH 8.0); abrupt smooth boundary.

Btk--7 to 12 inches; brown (10YR 5/3) extremely cobbly clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine, and few medium roots; many very fine tubular pores; many thin clay films on faces of peds and in pores; and 40 percent pebbles and 30 percent cobbles; common thin lime coating on rock fragments; strongly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bqkm--12 to 30 inches; white (10YR 8/1) indurated duripan that is very stony, cobbly, and gravelly; light yellowish brown (10YR 6/4) silica coatings; massive; extremely hard, extremely firm; violently effervescent.

R--30 inches; hard basalt bedrock.

**Type location:** 800 feet south and 2,400 feet east of the northwest corner of section 5, R. 43 E., T. 4 N. (38 degrees, 14 minutes, 09 seconds north latitude; 117 degrees, 10 minutes, 33 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Moist in winter and spring months, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to indurated pan:** 8 to 14 inches.

**Depth to bedrock:** 20 to 40 inches.

**Control section:**

Clay content--Averages 20 to 30 percent.

Rock fragments--35 to 80 percent.

**A horizon:**

Value--5 through 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Carbonates--Noneffervescent to slightly effervescent.

Reaction--Mildly alkaline to moderately alkaline.

**Bt and Btk horizons:**

Value--5 or 6 dry, 3 through 5 moist.

Chroma--2 through 4.

Clay content--27 to 35 percent.

Structure--Prismatic, subangular blocky, or angular blocky.

Consistence--Slightly hard to hard, dry, very friable to friable moist, slightly sticky to sticky and slightly plastic to plastic moist.

## Wabuska Series

The Wabuska series consists of very deep, somewhat poorly drained soils formed on lake plains in alluvium from mixed rocks. Slopes are 0 to 2 percent. Mean annual temperature is 51 degrees F., and the mean annual precipitation is about 5 inches.

**Taxonomic class:** Coarse-loamy, mixed (calcareous), mesic Aeric Halaquepts

**Typical pedon:** Wabuska loamy sand, in map unit 1360, rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; moderate thick platy structure; soft, very friable, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

A2--2 to 4 inches; pale brown (10YR 6/3) very fine sandy loam, brown, (10YR 4/3) moist; moderate thick platy structure; soft, very friable, nonsticky, nonplastic; few very fine roots; many very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

C--4 to 7 inches; pale brown (10YR 6/3) loamy fine sand, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky, slightly plastic; common fine roots; many very fine interstitial pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

Ck1--7 to 10 inches; pale brown (10YR 6/3) finely stratified fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky, nonplastic; common fine roots; many very fine tubular pores; 10 percent irregular shaped lime nodules; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary.

Ck2--10 to 20 inches; pale brown (10YR 6/3) finely stratified very fine sandy loam, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky, nonplastic; common fine roots; many very fine

interstitial pores; 10 percent irregular shaped lime nodules; strongly effervescent; strongly alkaline (pH 9.0); abrupt smooth boundary. (Ck1 and Ck2 combined thickness--8 to 16 inches)

- C1--20 to 42 inches; pale brown (10YR 6/3) finely stratified fine sandy loam to silt loam, dark brown (10YR 3/3), moist, with few medium and fine dark yellowish brown (10YR 4/6) mottles; soft, very friable, nonsticky, slightly plastic; common fine roots; many fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); abrupt wavy boundary.
- 2C2--42 to 60 inches; light brownish gray (10YR 6/2) finely stratified sand, brown (10YR 4/3), moist; massive; slightly hard, very friable, nonsticky, nonplastic; few very fine roots; many fine interstitial pores; strongly effervescent; strongly alkaline (pH 9.0)

**Type location:** 1,800 feet north and 1,700 feet west of the southeast corner, section 31, T. 13 N., R. 34 E.; (38 degrees, 56 minutes, 52 seconds north latitude; 118 degrees, 11 minutes, 14 seconds west longitude.)

#### Range in characteristics:

**Soil moisture:** Saturated at 36 to 60 inches for 30 to 60 days in the spring, or is artificially drained. The upper part of the profile is moist for short periods in the winter and early spring, otherwise it is dry.

**Soil temperature:** 53 to 59 degrees F.

**Sodium absorption ratio:** Commonly above 30 in upper 20 inches and decreases below this depth.

**Reaction:** Strongly alkaline or very strongly alkaline and very slightly effervescent to strongly effervescent in the upper 20 inches. Mildly alkaline through strongly alkaline and noneffervescent to strongly effervescent below 20 inches.

**Control section:**

Clay content--Averages 10 to 18 percent.

#### A horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3, dry or moist.

#### C and Ck horizons:

Hue--10YR or 2.5Y.

Value--5 through 8 dry, 3 through 5 moist.

Chroma--2 through 4.

Texture--Stratified loam to sand, mostly fine sandy loam.

Structure--Subangular blocky or massive.

Consistence--Soft to slightly hard or loose, very friable and sticky to slightly sticky, nonplastic to slightly plastic.

Mottles--Faint to prominent.

## Wardenot Series

The Wardenot series consists of very deep, excessively drained soils that formed in alluvium from mixed rocks. Wardenot soils formed on fan piedmonts, fan skirts, alluvial flats and inset fans. Slopes are 2 to 8 percent. The mean annual precipitation is about 5 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Typic Torriorthents

**Typical pedon:** Wardenot very gravelly loamy sand, in map unit 1660, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 55 percent pebbles and 5 cobbles.

A--0 to 1 inch; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common very fine vesicular pores; 50 percent pebbles, 5 percent cobbles; violently effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

Bk--1 to 14 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common medium and fine roots; many fine interstitial pores; 45 percent pebbles, 10 percent cobbles; few thin lime pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.6) abrupt wavy boundary.

Bqk1--14 to 34 inches; pale brown (10YR 6/3) finely stratified very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common medium and fine roots; many fine interstitial pores; 50 percent pebbles; few thin lime and silica pendants on rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bqk2--34 to 49 inches; brown (10YR 5/3) stratified extremely cobbly loamy sand to very gravelly sandy loam, dark brown (10YR 3/3); massive; soft, very friable, nonsticky and nonplastic common fine and few medium coarse roots; many fine interstitial pores; 40 percent pebbles, 20 percent cobbles; few thin lime and silica pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.8); clear wavy boundary. (combined thickness of Bqk 3 to 48 inches)

B'k2--49 to 60 inches; pale brown (10YR 6/3) finely stratified very gravelly loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common fine and medium, few coarse roots; many fine interstitial pores; 40 percent pebbles, 10 percent cobbles; few thin lime pendants on rock fragments; violently effervescent; strongly alkaline (pH 8.8).

**Type location:** 700 east and 2,200 feet south of the northwest corner of Section 34, T. 12 N., R. 36 E. (38 degrees, 51 minutes, 36 seconds north latitude; 117 degrees, 55 minutes, 28 seconds west longitude.)

**Range in characteristics:**

**Soil moisture:** Usually dry, moist in some part for short periods during winter and early spring months and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Reaction:** Mildly alkaline to strongly alkaline, commonly increases with depth.

**Control section:**

Rock fragments--40 to 75 percent; includes cobbles and stones.

**A horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Carbonates--Noneffervescent to strongly effervescent, may be violently effervescent where influenced by eolian depositions.

**Bk and Bqk horizons:**

Value--5 through 7 dry, 3 through 5 moist.

Chroma--2 through 4.

Structure--Single grained or massive.

Consistence--Nonsticky to slightly sticky and nonplastic to slightly plastic.

Texture--Stratified extremely gravelly fine sandy loam to cobbly loamy sand. Strata of very gravelly or cobbly sandy loam or fine sandy loam in upper part of substratum.

Texture (less than 2 millimeters)--Averages loamy sand.

Rock fragments--40 to 75 percent average; individual strata have as little as 25 percent rock fragments.

Other features--Lime and silica pendants commonly are present in some part of the B horizon.

Carbonates--Strongly effervescent or violently effervescent.

## Watoopah Series

The Watoopah series consists of very deep, well drained soils that formed in alluvium from tuff and related volcanic rocks. Watoopah soils are on fan piedmonts. Slopes are 2 to 8 percent. The mean annual precipitation is about 8 inches. The mean annual temperature is about 53 degrees F.

**Taxonomic class:** Coarse-loamy, mixed, mesic Durixerollic Haplargids

**Typical pedon:** Watoopah gravelly loamy sand, in map unit 1410, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 35 percent pebbles.

A1--0 to 1 inch; pale brown (10YR 6/3) gravelly loamy sand, brown (10YR 4/3) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 25 percent pebbles; mildly alkaline (pH 7.4); abrupt smooth boundary.

A2--1 to 3 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; moderate coarse platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and fine interstitial and vesicular pores; 10 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.

Bt--3 to 12 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, medium and coarse roots; many very fine and fine tubular pores; few thin clay films lining pores; 10 percent pebbles; mildly alkaline (pH 7.4); clear smooth boundary.

Bq--12 to 24 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine, few medium roots; many very fine tubular pores; 20 percent pebbles; 30 percent weakly cemented with silica; mildly alkaline (pH 7.6); clear smooth boundary.

Bqk--24 to 36 inches; very pale brown (10YR 7/3) gravelly loamy sand, brown (10YR 5/3) moist; massive; hard, firm, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial and tubular pores; 30 percent pebbles; continuous brittle matrix; discontinuous strong lime and silica cementation; strongly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

C--36 to 60 inches; pale brown (10YR 6/3) stratified very gravelly coarse sandy loam to coarse sand; brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine, fine and medium roots; many very fine interstitial pores; 30 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2).

**Type location:** Approximately 1,900 feet east and 900 feet north of the southwest corner of section 7, T. 6 N., R. 49 E. (38 degrees, 22 minutes, 50 seconds north latitude; 116 degrees, 32 minutes, 14 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Moist in winter and spring and for 10 to 20 days cumulative in the upper part, between June and September due to convection storms.

*Soil temperature:* 53 to 59 degrees F.

*Depth to Bq horizon:* 10 to 24 inches.

**Control section:**

Clay content--10 to 18 percent.

Rock fragments--5 to 25 percent, mainly pebbles.

**A horizons:**

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral or mildly alkaline.

**Bt horizon:**

Hue--10YR or 7.5YR

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Sandy loam, fine sandy loam; subhorizons of sandy clay loam are in some pedons.

Consistence--Friable or very friable moist; nonsticky to sticky and nonplastic to plastic, wet.

Reaction--Neutral or mildly alkaline.

**Bq and Bqk horizons:**

Value--5 through 7 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Loamy sand or sandy loam.

Structure--Massive or subangular blocky.

Consistence--Soft to hard, very friable or firm, nonsticky or slightly sticky and nonplastic or slightly plastic.

Carbonates--Noneffervescent to strongly effervescent.

Rock fragments--5 to 35 percent, mainly pebbles.

Reaction--Mildly alkaline to moderately alkaline.

Other features--Weakly cemented; some pedons contain 5 to 25 percent strongly cemented durinodes and contain continuous brittle matrix.

**C horizon:**

Value--6 or 7 dry, 4 through 6 moist.

Chroma--3 or 4.

Texture--Stratified. Average texture is sand or loamy sand.

Rock fragments--15 to 35 percent, mainly pebbles.

Individual strata have from 5 to 55 percent rock fragments.

Carbonates--Slightly effervescent to violently effervescent.

Reaction--Moderately alkaline to strongly alkaline.

Other features--Weakly cemented lenses and durinodes are in some pedons.

**Whilphang Series**

The Whilphang series consists of shallow, well drained soils that formed in residuum and colluvium from tertiary lacustrine sediments with a component of mixed alluvial material. Whilphang soils are on pediments. Slopes are 4 to 30 percent. The mean annual precipitation is about 8 inches and the mean annual temperature is about 53 degrees F.

**Taxonomic class:** Loamy, mixed (calcareous), mesic, shallow Xeric Torriorthents.

**Typical pedon:** Whilphang sandy loam, in map unit 2120 rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is partially covered with 20 percent pebbles.

A1--0 to 2 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; few fine roots; common fine interstitial pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2--2 to 7 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; moderately thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots through coarse roots; common very fine vesicular and few very fine interstitial pores; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

A3--7 to 12 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine through coarse roots; common fine tubular pores; 20 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr--12 inches; highly fractured mudstone with lime and discontinuous 1 to 2 millimeters silica coatings in fractures; many roots in fractures.

**Type location:** 2,200 feet south and 1,800 feet west of the northeast corner of section 6, T. 9 N., R. 37 E. (38 degrees, 40 minutes, 05 seconds north latitude; 117 degrees, 53 minutes, 53 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Moist in winter and spring; dry in summer and fall except moist for 10 to 20 days cumulative between July to October due to convection storms.

*Soil temperature:* 54 to 59 degrees F.

*Depth to soft bedrock:* 10 to 20 inches.

*Reaction:* Moderately alkaline or strongly alkaline.

*Carbonates:* Strongly effervescent or violently effervescent.

*Control section:*

Clay content--Averages 10 to 18 percent.

Rock fragments--Averages 15 to 35 percent.

**A horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3 dry or moist.

## Whirlo Series

The Whirlo series consists of very deep, well drained soils that formed in mixed alluvium with a component of loess. Whirlo soils are on inset fans and fan skirts. Slopes are 2 to 8 percent. The annual precipitation is about 7 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed, mesic Typic Camborthids

**Typical pedon:** Whirlo gravelly sandy loam, in map unit 1061, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 30 percent pebbles and 5 percent cobbles.

A1--0 to 3 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark brown (3/3) moist; weak thin platy structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 25 percent pebbles; 5 percent cobbles; moderately alkaline (pH 8.2); abrupt smooth boundary.

A2--3 to 9 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; many very fine interstitial pores; 25 percent pebbles; 5 percent cobbles; moderately alkaline (pH 8.2); abrupt smooth boundary.

Bw--9 to 20 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; moderate coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and few medium roots; few fine and medium tubular pores and many very fine interstitial pores; 20 percent pebbles; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Bk1--20 to 37 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 4/3) moist; massive, soft, very friable, nonsticky and slightly plastic; many fine and few medium roots; many very fine interstitial pores; 65 percent pebbles; 5 percent cobbles; common thin lime

pendants on rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Bk2--37 to 60 inches; pale brown (10YR 6/3) stratified very gravelly loam to extremely gravelly coarse loamy sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 50 percent pebbles; 5 percent cobbles; few thin lime pendants on rock fragments; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** 700 feet north and 2,000 feet west of the southeast corner of section 6, T. 12 N., R. 35 E. (38 degrees, 55 minutes, 42 seconds north latitude; 118 degrees, 10 minutes, 09 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Moist in winter and spring, dry mid-May through November.

*Soil temperature:* 47 to 53 degrees F.

*Depth to 2Bk horizon:* 10 to 20 inches.

*Control section:*

Clay content--5 to 15 percent.

Rock fragments--Averages 35 to 70 percent, mainly pebbles

**A horizons:**

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Neutral to moderately alkaline.

**Bw horizon:**

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 or 3.

Texture--Gravelly sandy loam, fine sandy loam, very fine sandy loam, silt loam or gravelly loam.

Rock fragments--0 to 30 percent pebbles.

Structure--Prismatic or massive.

Reaction--Neutral to moderately alkaline.

Consistence--Soft or slightly hard, dry; very friable or friable, moist; nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

**2Bk horizons:**

Hue--10YR or 2.5Y.

Value--6 through 8 dry, 3 through 6 moist.

Chroma--2 through 4.

Texture--Stratified very gravelly loam to extremely gravelly coarse sandy loam. Thin strata of extremely gravelly loamy sand are in the lower part of some pedons.

Rock fragments--35 to 75 percent, mainly pebbles with some cobbles and stones.

Consistence--Nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Reaction--Moderately alkaline or strongly alkaline.

Carbonates--Slightly effervescent to violently effervescent.

Other features--Up to 10 percent weak durinodes or thin silica pendants or rock fragments common in some subhorizons.

## Wholan Series

The Wholan series consists of very deep, well drained soils that formed in a loess mantle over silty alluvium from mixed rock sources. Wholan soils are on inset fans. Slopes are 0 to 2 percent. The mean annual precipitation is about 7 inches and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Coarse-silty, mixed, mesic Typic Camborthids

**Typical pedon:** Wholan very fine sandy loam, in map unit 2230, rangeland. (Colors are for dry soil unless otherwise noted.)

A1--0 to 2 inches; light brownish gray (10YR 6/2) very fine sandy loam, brown (10YR 4/3) moist; moderate thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine and fine interstitial pores; moderately alkaline (pH 8.2); abrupt smooth boundary.

A2--2 to 4 inches; light brownish gray (10YR 6/2) silt loam, brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and medium roots; common very fine and fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bw1--4 to 9 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak medium and coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few medium roots; common very fine and fine tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bw2--9 to 17 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few medium roots; many very fine and few tubular pores; moderately alkaline (pH 8.2); clear smooth boundary.

Bk--17 to 26 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular pores; strongly effervescent; common fine distinct white spots of secondary carbonates; moderately alkaline (pH 8.2); clear wavy boundary.

C1--26 to 31 inches; white (10YR 8/2) fine sandy loam, light brownish gray (10YR 6/2) moist;

massive; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; common very fine and fine tubular pores; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C2--31 to 60 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; common very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.6).

**Type location:** 200 feet north and 100 feet west of the southeast corner of section 1, T. 15 N., R. 47 E. (39 degrees, 09 minutes, 32 seconds north latitude; 116 degrees, 37 minutes, 06 seconds west longitude.)

### Range in characteristics:

**Soil moisture:** Usually dry, moist in winter and spring, dry late May through October.

**Soil temperature:** 47 to 53 degrees F.

**Depth to Bk horizon:** 11 to 24 inches.

**Reaction:** Mildly alkaline to very strongly alkaline, increasing with depth.

**Salt and sodium:** These soils are free or slightly salt and sodium affected to depths of 30 inches, and moderately or strongly affected below this depth. Other features--Thin strata with up to 5 percent one-half to three-fourth inch very hard, firm, brittle durinodes are in the C horizons of some pedons.

**Control section:**

Clay content--5 to 15 percent.

### A horizons:

Value--5 through 7 dry, 3 through 5 moist (5 dry and 3 moist in the A1 horizon only.)

Chroma--2 through 4.

Carbonates--Noneffervescent or slightly effervescent.

### Bw horizons:

Value--6 or 7 dry, 4 or 5 moist.

Chroma--2 through 4.

Texture--Silt loam, very fine sandy loam with thin strata of loam or fine sandy loam in some pedons.

Structure--Weak fine to coarse subangular blocky, medium or coarse prismatic.

Consistence--Soft or slightly hard dry; nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

### Bk and C horizons:

Value--6 through 8 dry, 4 through 6 moist.

Chroma--2 through 4.

Consistence--Nonsticky or slightly sticky and nonplastic or slightly plastic, wet.

Texture--Silt loam, very fine sandy loam with thin strata of loam or fine sandy loam in some pedons.

Carbonates--Few to many, fine or medium veins and soft masses of lime in Bk horizons. C horizons lack segregated lime.

Durinodes--Up to 5 percent in some substrata of some pedons.

Other features--C horizons are below a depth of 60 inches in some pedons.

## Wieland Series

The Wieland series consists of very deep, well drained soils that formed in alluvium from mixed rock sources with a component of loess and volcanic ash. Wieland soils are on fan piedmont remnants. Slopes are 2 to 30 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 48 degrees F.

**Taxonomic class:** Fine, montmorillonitic, mesic Durixerollic Haplargids

**Typical pedon:** Wieland gravelly loam, in map unit 2345 rangeland. (Colors are for dry soil unless otherwise noted.) The suurface is covered with 25 percent pebbles.

A--0 to 8 inches; light brownish gray (10YR 6/2) gravelly loam, dark grayish brown (10YR 4/2) moist; weak thick platy structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; many very fine vesicular and interstitial pores; 15 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bt1--8 to 13 inches; pale brown (10YR 6/3) clay loam; dark brown (10YR 4/3) moist; moderate medium prismatic structure; slightly hard, friable, sticky and very plastic; few very fine and common fine roots; few very fine tubular pores; many thin clay films on faces of peds and lining pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bt2--13 to 23 inches; light yellowish brown (10YR 6/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; hard, firm, very sticky and very plastic; common very fine, fine and medium roots; many very fine tubular pores; many thick clay films on faces of peds and lining pores; 5 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary.

Bt3--23 to 30 inches; light yellowish brown (10YR 6/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; moderate coarse subangular blocky structure; hard, firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; many moderately thick clay films and pressure

faces; 30 percent pebbles; moderately alkaline (pH 8.0); clear wavy boundary.

Bqk1--30 to 36 inches; very pale brown (10YR 7/3) gravelly clay loam, yellowish brown (10YR 5/4) moist; massive; very hard, firm, slightly sticky and slightly plastic; 20 percent 15 to 25 millimeters hard, firm durinodes; common thin silica coats; common fine lime in filaments; continuous brittle matrix; 15 percent pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bqk2--36 to 41 inches; very pale brown (10YR 7/3) gravelly loam, light yellowish brown (10YR 6/4); massive; very hard, firm, and brittle; few very fine tubular pores; 20 percent, 15 to 25 millimeters hard, firm durinodes; continuous thin and moderately thick silica coats; common fine lime and in filaments; 25 percent pebbles; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bqk3--41 to 60 inches; very pale brown (10YR 7/3) gravelly sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable; nonsticky and nonplastic; few very fine tubular pores; 15 percent, 10 to 20 millimeters hard, firm silica and lime cemented durinodes; few thin silica coats; 30 percent pebbles; violently effervescent; moderately alkaline (pH 8.2).

**Type location:** 2,150 feet west and 1,700 feet north of the southeast corner of section 17, T. 13 N., R. 40 E. (38 degrees, 59 minutes, 32 seconds north latitude; 117 degrees, 30 minutes, 02 seconds west longitude.)

### Range in characteristics:

**Soil moisture:** Usually dry, moist from mid fall through spring, dry summer through fall.

**Soil temperature:** 47 to 52 degrees F.

**Depth to continuous brittle Bqk horizons:** 19 to 30 inches.

**Depth to base of Bt horizon:** 17 to 30 inches.

Other features--Gravelly substratum phases are recognized that have variegated colored Bqk horizons with textures of very gravelly loamy sand at a depth of 40 or more inches. The Bqk horizon ranges from 50 to 65 percent pebbles. Some pedons have thin BA horizons.

### Control section:

Clay content--Averages 40 to 55 percent, when mixed.

Rock fragments--Averages 5 to 35 percent pebbles, when mixed.

### A horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

Reaction--Mildly alkaline or moderately alkaline.

**Bt1 horizons:**

Value--5 or 6 dry, 3 or 4 moist.  
 Chroma--2 or 3.  
 Structure--Weak or moderate very fine to medium subangular blocky or prismatic.  
 Consistence--Slightly hard or hard, dry; very friable through firm moist; sticky or very sticky and plastic or very plastic wet.  
 Reaction--Mildly alkaline or moderately alkaline.

**Bt2 and Bt3 horizons:**

Value--5 through 7 dry, 3 through 5 moist.  
 Chroma--2 through 4 dry, and 3 or 4 moist.  
 Clay content--40 to 55 percent, when mixed, some pedons have subhorizons with up to 60 percent clay.  
 Rock fragments--5 to 35 percent pebbles, when mixed.  
 Structure--Weak or moderate, fine to coarse prismatic or very fine to medium angular blocky.  
 Reaction--Moderately alkaline or strongly alkaline.  
 Other features--Some pedons are slightly effervescent to strongly effervescent and commonly have lime filaments in the lower Bt horizons.

**Bqk horizon:**

Hue--10YR, 7.5YR or 2.5Y.  
 Value--6 through 8 dry, 4 through 6 moist.  
 Chroma--1 through 6.  
 Texture--Loam, gravelly sandy clay loam, or gravelly clay loam.  
 Rock fragments--5 to 35 percent, mainly pebbles.  
 Consistence--Slightly hard to very hard dry, very friable to firm moist; nonsticky or slightly sticky and nonplastic or slightly plastic, wet.  
 Effervescence--Slightly effervescent to violently effervescent.  
 Cementation--Some pedons have thin discontinuous brittle Bqk subhorizons above the continuously brittle horizon. Horizon with continuous brittle matrix have firm consistence when moist.  
 Gypsum--Is absent in the lower part of some pedons.  
 Relict Mottles--Present in many pedons at any depth below 30 inches.  
 Reaction--Moderately alkaline to strongly alkaline.

**Wiffo Series**

The Wiffo series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium from mainly calcareous sedimentary rocks. The Wiffo soils are on inset fans. Slopes are 2 to 8 percent. The mean annual precipitation is about 9 inches and the mean annual temperature is about 49 degrees F.

**Taxonomic class:** Loamy-skeletal, mixed (calcareous), mesic Xeric Torriorthents

**Typical pedon:** Wiffo very gravelly loam, in map unit 2341, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 35 percent pebbles.

- A1--0 to 4 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; weak thick platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; many very fine and fine vesicular pores; 35 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary.
- A2--4 to 9 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine and medium roots; few fine tubular pores; 35 percent pebbles; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary.
- 2C1--9 to 25 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, and few medium and coarse roots; many very fine interstitial pores; thin lime coats on undersides of rock fragments; 55 percent pebbles; violently effervescent; strongly alkaline (pH 9.0); clear wavy boundary.
- 3C2--25 to 60 inches; very pale brown (10YR 7/3) stratified extremely gravelly sandy loam to very gravelly coarse sand, dark grayish brown (10YR 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; 75 percent pebbles; thin lime coats on undersides of rock fragments; violently effervescent; strongly alkaline (pH 9.0).

**Type location:** 2,000 feet east and 1,200 feet south of the northwest corner of section section 11, T. 12 N., R. 46 E. (38 degrees, 53 minutes, 52 seconds north latitude; 116 degrees, 45 minutes, 47 seconds west longitude.)

**Range in characteristics:**

- Soil moisture:* Usually dry, moist in winter and spring, dry June through October.
- Soil temperature:* 47 to 52 degrees F.
- Depth to 2C horizon:* 5 to 10 inches.
- Depth to 3C horizon:* 20 to 35 inches.
- Profile reaction:* Moderately alkaline or strongly alkaline.
- Control section:*
- Clay content--Averages 5 to 15 percent.
- Rock fragments--Averages 50 to 75 percent, mainly pebbles.
- Effervescence--Strongly effervescent or violently effervescent.

Calcium carbonate equivalent--Averages 15 to 25 percent.

**A horizons:**

Value--6 or 7 dry, 4 or 5 moist.  
Chroma--2 or 3.

**2C horizon:**

Value--6 or 7 dry, 4 or 5 moist.  
Chroma--2 through 4.  
Texture--Very gravelly sandy loam, extremely gravelly sandy loam.  
Clay content--Averages 8 to 15 percent.  
Structure--Weak subangular blocky or it is massive.

**3C horizon:**

Hue--10YR or 2.5Y.  
Value--7 or 8 dry, 4 through 6 moist.  
Chroma--2 through 4.  
Texture--Stratified extremely gravelly sandy loam to very gravelly coarse sand.  
Clay content--5 to 15 percent.  
Structure--The horizon is massive, or single grained.  
Consistence--Soft or loose, loose or very friable.

## Wrango Series

The Wrango series consists of very deep, excessively drained soils that formed in alluvium from mixed rock sources. Wrango soils are on inset fans. Slopes are 2 to 8 percent. Mean annual precipitation is about 9 inches and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Xeric Torriorthents

**Typical pedon:** Wrango very gravelly loamy sand in map unit 1648, rangeland. (Colors are for dry soil unless otherwise noted.) The soil surface is covered with 60 percent pebbles.

A--0 to 2 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; moderately thick platy structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine vesicular pores; 35 percent pebbles; moderately alkaline (pH 8.2); clear smooth boundary.

C1--2 to 6 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; 35 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary. (combined thickness of C1 and C2- 2 to 12 inches thick)

C2--6 to 12 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist;

massive; soft, very friable, slightly sticky and slightly plastic; common very fine through medium roots; common fine tubular pores; 35 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2Bk1--12 to 22 inches; pale brown (10YR 6/3) finely stratified very gravelly loamy sand, dark brown (10YR 3/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine tubular pores; 50 percent pebbles and 5 percent cobbles; few thin lime coats on underside of pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2Bk2--22 to 60 inches; pale brown (10YR 6/3) stratified extremely gravelly loamy coarse sand to extremely gravelly sand, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; 65 percent pebbles and 5 percent cobbles; few lime coats on underside of pebbles; strongly effervescent; moderately alkaline (pH 8.4).

**Type location:** 600 feet west and 2,200 feet south of the northeast corner of section 27, T. 9 N., R. 37 E. (38 degrees, 36 minutes, 38 seconds north latitude; 117 degrees, 50 minutes, 23 seconds west longitude.)

**Range in characteristics:**

*Soil moisture:* Usually dry, moist in winter and spring, dry June through October.

*Soil temperature:* 53 to 59 degrees F.

*Reaction:* Mildly alkaline or moderately alkaline.

*Control section:*

Clay--0 to 8 percent.

Rock fragments--Averages 60 to 75 percent.

**A horizon:**

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Carbonates--Noncalcareous or slightly effervescent.

**C horizons:**

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Structure--Massive or subangular blocky.

Texture--Averages loamy coarse sand and sand.

Consistence--Slightly sticky or sticky, slightly plastic or nonplastic.

**Bk horizons:**

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Carbonates--Slightly effervescent to violently effervescent.

Texture of fine earth--Loamy coarse sand, sand or loamy sand.

Structure--Massive or single grained.

Consistence--Soft, slightly hard to loose.

latitude; 116 degrees, 36 minutes, 20 seconds west longitude.)

## Yomba Series

The Yomba series consists of very deep, somewhat excessively drained soils that formed in mixed alluvium. Yomba soils are on alluvial flats, fan piedmonts and fan skirts. Slopes are 0 to 2 percent. Mean annual precipitation is about 5 inches and mean annual temperature is about 53 degrees F.

**Taxonomic class:** Sandy-skeletal, mixed, mesic Duric Camborthids

**Typical pedon:** Yomba gravelly fine sandy loam, in map unit 1911, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered with 25 percent pebbles.

A1--0 to 2 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine interstitial pores; 15 percent pebbles; mildly alkaline (pH 7.6); abrupt smooth boundary.

A2--2 to 4 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine vesicular pores; 10 percent pebbles; mildly alkaline (pH 7.8); abrupt smooth boundary.

Bw--4 to 16 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and medium roots; many very fine and fine interstitial and tubular pores; 10 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

2Bqk--16 to 23 inches; light gray (10YR 7/2) very gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, firm, nonsticky and nonplastic; few very fine, fine and medium roots; common very fine interstitial and tubular pores; continuous brittle matrix with silica and lime; 35 percent pebbles; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

3C--23 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine interstitial pores; 55 percent pebbles, 5 percent cobbles; noneffervescent to slightly effervescent; mildly alkaline (pH 7.8).

**Type location:** 1,400 feet west and 1,200 feet south of the northeast corner of section 28, T. 4 N., R. 48 E. (38 degrees, 10 minutes, 15 seconds north

### Range in characteristics:

**Soil moisture:** Usually dry, moist in some part for short periods during winters and early spring months, and for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to 2Bqk horizon:** 10 to 23 inches.

**Depth to 3C horizon:** 18 to 26 inches.

Rock fragments--40 to 60 percent.

### A horizons:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Carbonates--Noneffervescent or slightly effervescent.

Reaction--Mildly alkaline or moderately alkaline.

### Bw horizons:

Hue--10YR or 2.5Y.

Value--6 or 7 dry, 3 or 4 moist.

Chroma--2 or 3.

Texture--Sandy loam, fine sandy loam or loam.

Clay content--10 to 20 percent.

Rock fragments--0 to 15 percent, mainly pebbles.

Consistence--Soft to slightly hard, nonsticky to sticky and nonplastic to plastic.

Carbonates--Strongly effervescent or violently effervescent.

Reaction--Moderately alkaline or strongly alkaline.

Structure--Platy, prismatic or subangular blocky.

### 2Bqk horizon:

Value--6 or 7 dry, 4 through 6 moist.

Chroma--2 through 4.

Texture (less than 2 millimeter)--Coarse sandy loam, sandy loam.

Consistence--Hard to very hard, friable to firm.

Rock fragments--30 to 50 percent, dominantly pebbles.

Carbonates--Strongly effervescent or violently effervescent.

Reaction--Moderately alkaline or strongly alkaline.

Other features--Has laminae with cementation that ranges from hard, firm, brittle consistence with silica bridges to 1/4 inch thick discontinuous strongly cemented layers in pockets and seams.

### 3C horizon:

Value--6 or 7 dry, 3 through 5 moist.

Chroma--1 through 3.

Texture (less than 2 millimeter)--Sand, strata with variable percents of pebbles and cobbles, dominantly pebbles.

Rock fragments--50 to 70 percent.

Carbonates--Noneffervescent or slightly effervescent.  
Reaction--Mildly alkaline to strongly alkaline.

## Zadvar Series

The Zadvar series consists of shallow over a duripan, well drained soils that formed in mixed alluvium from volcanic rock sources. Zadvar soils are on fan piedmonts and intermountain fan remnants. Slopes are 2 to 30 percent. Mean annual precipitation is about 9 inches and mean annual temperature is about 52 degrees F.

**Taxonomic class:** Loamy, mixed, mesic, shallow Haploxerollic Durargids

**Typical pedon:** Zadvar gravelly fine sandy loam, in map unit 1461, rangeland. (Colors are for dry soils unless otherwise noted.) The surface is covered with 30 percent pebbles.

- A1--0 to 3 inches; pale brown (10YR 6/3) gravelly fine sandy loam, brown (10YR 4/3) moist; moderate medium platy structure; soft, very friable, slightly sticky and nonplastic; many fine through coarse vesicular pores; 15 percent pebbles; moderately alkaline (pH 8.0); abrupt smooth boundary.
- A2--3 to 6 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky and nonplastic; common fine roots; few fine vesicular and common fine tubular pores; 10 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary.
- Bt--6 to 11 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic parting to strong fine subangular blocky structure; hard, friable, sticky and plastic; common fine and coarse roots; common fine tubular pores; common moderately thick clay films on faces of peds, lining pores, and staining sand grains, 25 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.3); clear wavy boundary.
- Bqkm--11 to 28 inches; continuous strongly cemented hardpan with discontinuous indurated silica laminae; massive; brittle, nonsticky and nonplastic; few fine roots in pockets; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
- Bqk--28 to 60 inches; light brownish gray (10YR 6/2) stratified very gravelly coarse sand to extremely gravelly sandy loam with discontinuous strong silica and lime cementation; brown (10YR 4/3) moist; massive; soft to hard, very friable to brittle; nonsticky and nonplastic; few fine roots in pockets; many fine interstitial pores; 65 percent pebbles; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** 2,000 feet north and 1,900 feet east of the southwest corner of section 2, T. 1 N., R. 48 E. (37 degrees, 57 minutes, 57 seconds north latitude; 116 degrees, 34 minutes, 22 seconds west longitude.)

### Range and characteristics

**Soil moisture:** Usually dry, moist in winter and spring months, dry in summer and fall except for 10 to 20 days cumulative between July to October due to convection storms.

**Soil temperature:** 53 to 59 degrees F.

**Depth to hardpan:** 10 to 14 inches.

**Control section:**

Clay content--Averages 18 to 27 percent.

Rock fragments--Averages 20 to 35 percent.

**A horizons:**

Value--6 or 7 dry, may be 5 in upper part; 4 or 5 moist.

Chroma--2 or 3.

Reaction--Mildly alkaline or moderately alkaline.

Carbonates--Noncalcareous to strongly effervescent.

**Bt horizon:**

Value--5 or 6 dry, 4 or 5 moist.

Chroma--3 or 4.

Texture--Clay loam or sandy clay loam.

Structure--Prismatic or subangular blocky.

Consistence--Slightly hard or hard.

Rock fragments--10 to 30 percent, mainly pebbles.

Clay content--Usually averages 27 to 35 percent clay, but may have more than 35 percent clay.

Reaction--Mildly alkaline or moderately alkaline.

Carbonates--Noncalcareous, some pedons may be slightly effervescent to strongly effervescent in the lower part.

**Bqk horizon:**

Chroma--2 or 3.

Texture--Stratified sand, loamy sand, sandy loam.

Consistence--Soft to hard, very friable to brittle.

Reaction--Moderately alkaline or strongly alkaline.

Carbonates--Strongly effervescent or violently effervescent.

Rock fragments--35 to 65 percent, mainly pebbles.

Other features--Some pedons have Bqk horizons above the hardpan with very gravelly to gravelly sandy loam or loam texture. This is a result of degradation of the duripan.

## Zaidy Series

The Zaidy series consists of moderately deep over a strongly cemented duripan, well drained soils formed in alluvium from mixed volcanic rocks. Zaidy soils occur on fan piedmont remnants. Slopes are 2 to 30 percent.

The annual precipitation is about 9 inches and the mean annual temperature is about 47 degrees F.

**Taxonomic class:** Fine-loamy, mixed, mesic  
Haploxerollic Durargids

**Typical pedon:** Zaidy very gravelly fine sandy loam, in map unit 1451, rangeland. (Colors are for dry soil unless otherwise noted.) The surface is covered by approximately 40 percent pebbles and 5 percent cobbles.

A--0 to 4 inches; pale brown (10YR 6/3) very gravelly fine sandy loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; 30 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary.

Bt--4 to 12 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; common very fine and fine roots; common fine and medium tubular pores; few thin clay films on faces of peds; 15 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.8); clear smooth boundary.

Btk--12 to 18 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; strong fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common fine and medium tubular pores; common thin and few moderately thick clay films on faces of peds and lining pores; 25 percent pebbles, 5 percent cobbles; few fine soft lime masses; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bqk--18 to 22 inches; very pale brown (10YR 7/4) gravelly loam, yellowish brown (10YR 5/4) moist; strong thick platy structure; hard, firm, slightly sticky and slightly plastic; common very fine and few fine roots; few fine tubular pores; 25 percent pebbles, 5 percent cobbles; 20 percent weak discontinuous silica cementation; common medium soft lime masses and filaments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bqkm1--22 to 31 inches; very pale brown (10YR 7/4) continuous strongly cemented duripan, yellowish

brown (10YR 5/4) moist; strong thick platy structure; extremely hard, extremely firm; few fine and very fine roots along horizontal fracture; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bqkm2--31 to 60 inches; very pale brown (10YR 7/4) strongly cemented duripan with a discontinuous thin indurated cap, yellowish brown (10YR 5/4) moist; massive; extremely hard, extremely firm; violently effervescent; moderately alkaline (pH 8.4).

**Type location:** 1,200 feet north and 200 feet east of the southwest corner of section 17, T. 9 N., R. 47 E. (38 degrees, 36 minutes, 58 seconds north latitude; 116 degrees, 36 minutes, 16 seconds west longitude.)

#### Range in characteristics:

*Soil moisture:* Usually dry, moist in some part mid October through May.

*Soil temperature:* 47 to 50 degrees F.

*Depth to base of Btk horizon:* 12 to 25 inches.

*Depth to carbonates:* 8 to 15 inches.

*Depth to duripan:* 20 to 30 inches.

*Reaction:* Mildly alkaline to moderately alkaline.

*Control section:*

Clay content--25 to 35 percent, when mixed.

Rock fragments--10 to 35 percent, mainly pebbles.

#### A horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--2 or 3.

#### Bt horizon:

Value--5 or 6 dry, 3 through 5 moist.

Chroma--4 through 6.

Consistence--Very friable to friable, nonsticky to slightly sticky, nonplastic to slightly plastic.

Other features--SAR is 6 to 13.

#### Btk horizon:

Value--5 or 6 dry, 3 or 4 moist.

Chroma--4 or 5.

Carbonates--Strongly effervescent or violently effervescent.

Consistence--Slightly sticky to sticky and slightly plastic to plastic.

#### Bqk horizon:

Consistence--Slightly hard to hard, friable to firm.



# Formation of the Soils

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This section relates the soils in the survey area to the major factors of soil formation.

Soil is a natural, three dimensional body at the earth's surface, which is capable of supporting plants. It is a dynamic mixture of mineral material, organic matter, air and water. Each soil has distinctive properties that are the product of environmental forces acting upon earthy material over a period of time.

Many different kinds of soils exist in Northeast Nye County within relatively short distances. These differences are the result of the interaction of: (1) parent material, including its physical characteristics, as well as its mineralogical and chemical composition; (2) climate, mainly temperature and precipitation, both in terms of the average as well as the variation throughout the year; (3) relief, which influences the internal and external environment of the soil such as drainage, aeration, susceptibility to erosion and exposure to the sun and wind; (4) biological forces, mainly the plant cover and the organisms living in and on the soil; and (5) the length of time these environmental forces have had to act on the soil material.

Northwest Nye County lies entirely in the Great Basin. Many of the present landforms are the result of events which took place during quaternary times.

## Climate

Climate affects soil formation through its effect on vegetation, and on the weathering, erosion, and deposition of soil material. The main climatic factors which influence soil formation in this area are precipitation, wind, and temperature.

The climate of the survey area is essentially continental, with warm dry summers and cool, moist winters. Temperatures and precipitation throughout the area vary considerably with elevation, aspect, and to some degree, storm track patterns. The average annual air temperature ranges from 57 degrees F at lower elevations in the extreme southern parts of the survey area to 45 degrees F or less on high mountain slopes. The average annual precipitation ranges from about 5 inches at the lowest elevation to over 16 inches at the higher elevations. Precipitation patterns, particularly as they relate to the time of year and the intensity of storms, play an important role in the formation of soils in this area.

Summer convection storms do not account for a very large amount of the total precipitation. However, due to their intensity and their pattern of frequency

over the years, these storms play an extremely important role in soil formation in this area. Unless protected by cover or in a position with favorable relief, the soils are subject to erosion. Precipitation patterns in the survey area reflect a general zonation with respect to elevation.

In the lower elevations of the survey area, the average annual precipitation is about 5 to 8 inches. In this arid part of the area weathering of parent material is slow, leaching is incomplete, and eluviation and illuviation proceed at a very slow rate. The plant cover is sparse and consists mainly of drought and salt-tolerant shrubs. Typically, the soils are low in organic matter and have thin, light colored A horizons. Soluble salts and calcium carbonate accumulate in the soil profile at a relatively shallow depth. Typic Torriorthents (Leo series) characterize soils that reflect soil formation in this arid part of the area.

In the mid elevations of the survey area, the average annual precipitation is about 8 to 12 inches, which results in deeper leaching of salts and calcium carbonate, decreased reaction, changes in the kind and density of vegetation, and a thicker, darker A horizon. Durixerollic Haplargids (Watoopah series) represents soil formed at the mid elevations where precipitation is about 10 inches.

At the higher elevations of the survey area, the precipitation is 12 to 16 inches and the temperatures are generally cooler. The vegetation is mostly Pinyon-Juniper, or in the highest elevations, sagebrush with a greater amount and variation in kinds of grasses. Leaching of salts and carbonates has been more intensive, the soils are neutral or slightly acid, and the A horizon is thick, and is high in organic matter. Typic Argixerolls (Squawtip series) are typical of the soils at the higher elevations.

The effect of wind on the soil formation in this area is exhibited in several ways. The presence of a desert pavement is typified by Typic Durargids (Lyda series). The deflation of the soil at the ground surface by high wind is thought to be a factor in the formation of desert pavements. The movement and deposition of sand in sand sheets or sand dunes strongly influences the formation of soils such as Typic Torripsammets (Stumble & Kawich series).

In winter, freezing and thawing generally occur throughout most of the survey area, except in the southern part of the area. The effects of frost action are discernible by the heaving of plants, and movement of the surface soil resulting from solifluction. At some of the higher elevations, freezing

and thawing has fractured and displaced the bedrock. Argic Cryoborolls (Packer series) with loamy-skeletal control sections are examples of soils at high elevations which have been affected by frost action.

In summer, the hot sun and lack of moisture drastically affect plant growth, especially in the southern part of the area. This effect is shown in both the lack of variety of plants and their lower root and foliar productivity. The lack of roots in the surface layer restricts the amount of organic matter in these soils. Typic Torriorthents (Izo series) is an example of soils with low organic matter formed in warm, arid areas.

## Relief

Relief, through its effects on drainage, runoff, erosion, and exposure to the sun and wind, has had an important effect on soil formation in the survey area. The mountain ranges, valleys, and flood plains reflect the gross variations in relief within the area.

The mountain ranges are mainly characterized by high relief. Runoff is rapid, and hazard of erosion is high. The removal of material by erosion inhibits or prevents soil development. Development in soils on unstable mountain surfaces that are subject to a high rate of geologic erosion is primarily limited to accumulation of organic matter to form a dark-colored horizon. A cambic or an argillic horizon has formed in the soils on more stable mountain surfaces where the rate of geologic erosion has been slower. Lithic Xerollic Haplargids (Stewval series) and Lithic Argixerolls (Bellehelen series) are examples of soils that formed on the more stable mountain slopes and have an argillic horizon. Lithic Xeric Torriorthents (Beelem series) are examples of soils on less stable mountain slopes where soil formation has been unable to act on parent material long enough for any of the aforementioned horizons to have developed.

Soils on concave and north-facing slopes, where snowpockets form and remain into late spring and early summer, support dense stands of shrubs and grass. The soils in these areas have developed a thick, dark-colored A horizon with a high content of organic matter. Argic Pachic Cryoborolls (Foxvire series) is an example of these soils.

The upper piedmont slopes are usually dissected, with stable interfluvial surfaces on the fan remnants and narrow drainages (13). The fan remnant surfaces have usually been stable for sufficient time to allow strong development to occur. Durixerollic Haplargids (Alley series) and Typic Durargids (Lyda series) are examples of soils which formed on these surfaces. The upper piedmont slopes may be overlain locally by more recent alluvium. Soils formed in this newer material generally lack strong development. Typic Camborthids (Koyen series) is an example of these soils.

The lower portion of the piedmont slopes are more gently sloping and not as sharply dissected. These

soils generally have fewer rock fragments throughout the profile due to the increased distance from the bordering mountains. The broad summits of the fan remnants are typically stable and have well developed profiles. Duric Haplargids (Unsel series) is an example of soils formed on lower fan remnants.

Valley floors have nearly level, well drained soils that carry very low velocity floodwater and runoff allowing some amount of deposition. These areas are represented by Typic Torrfluvents (Slaw and Cirac series). At the lowest parts of the valley floor, often adjacent to the playa, drainage is restricted, runoff is very slow, and salts accumulate. Aeric Halaquepts (Nuyobe series) are typical of soils with high salt concentrations on valley floors.

## Biological Forces

Plants, animals, insects, and microflora are important biological forces that affect soil formation in the survey area. Although animals, such as badgers and ground squirrels, and insects, such as cicadas, have had some effect on soil development, plants appear to have had the major biological influence on the soils in this survey area.

Due to the intensity of the summer storms, vegetation is particularly important in this area as it affects soil erosion. Where vegetation is sparse, there is little cover and a high rate of geological erosion occurs. Lithic Xeric Torriorthents (Beelem series) is an example of soils with little vegetal cover and a high rate of geologic erosion. In areas where the vegetative cover is thick, there is protection from the intense rains and the many roots help protect the soil from erosion. Typic Argixerolls (Squawtip series) is an example of such soils.

Because of climatic differences, plants vary considerably in kinds and amounts as elevation increases. On alluvial flats, fan piedmonts and hills at low elevations, the main plants are drought and salt-tolerant shrubs. Because of the scarcity of available moisture, plants cover only a small part of the surface. They add little organic matter to the soils and provide little protection from the wind and sun. Salt-tolerant shrubs also tend to recycle salts from the deeper layers to the surface soil. Typic Torriorthents (Izo series) typify soils formed with little vegetative cover.

The mountainous areas support dense stands of shrubs, grasses, and, in some places, trees. Because of the more abundant vegetation, the A horizon of the soils in these areas is thick, is high in organic matter, and is dark in color. Typic Argixerolls (Squawtip series) is an example of soils formed under abundant vegetation.

## Parent Material

Parent material is the earthy material from which soils are formed. The physical and chemical

composition of the parent material greatly influences the formation of soils. The main parent materials in this survey area are residuum and colluvium from volcanic and sedimentary rocks, alluvium, and eolian deposits. The volcanic rocks including basalt, rhyolite, and silicic tuff are the main source of parent material in the Kawich Range, Hot Creek Range, Paradise Range, Monte Cristo Mountains, Shoshone Mountains, San Antonio Mountains, Lodi Hills, Toiyabe Range, and Toquima Range. Volcanic rocks generally contain minerals which weather into clay when time and climatic conditions are favorable. For this reason, soils which formed in residuum and colluvium from this material on stable slopes form argillic horizons. Lithic Haplargids (Downeyville series) and Lithic Argixerolls (Bellehelen series) are examples of these soils.

The sedimentary formations, including sandstone, siltstone, dolomite, limestone, and quartzite, all exhibiting varying degrees of metamorphism, are the main source of parent material in the Royston Hills, Paradise Range, Cedar Mountains, and Toquima Range. There are two main characteristics which serve to separate the sedimentary parent materials: those which are high in carbonates, such as limestone and dolomite, and those with little or no carbonate, such as siltstone, sandstone, and quartzite. Carbonates have a tendency to disrupt the formation of argillic horizons, thus soils with high amounts of carbonates in the parent material lack argillic horizons. Lithic Xeric Torriorthents (Kyler and Logring series) are examples of these soils.

Alluvium deposited as alluvial fans, fan piedmonts, fan skirts, and alluvial flats, consists of sandy, loamy, silty, or clayey material of generally mixed mineralogy that has been eroded from the adjacent mountains. Alluvium deposited on fans and fan piedmonts is mostly loamy or sandy textured with varying amounts of pebbles, cobbles, and stones. Duric Haplargids (Unsel series) is an example of these soils.

Eolian material consisting mainly of sand has been deposited in large areas of Gabbs Valley, Ralston Valley, and Stone Cabin Valley. These deposits occur as sand sheets, most of which have been wind and water reworked, and as dunes. Examples of these soils are Typic Torripsamments (Stumble and Kawich series).

## Time

Time is a key factor in the formation of soils. The time available for a soil to develop in unconsolidated material is the time that has elapsed since the last deposits were laid down. Soils on sedimentary or igneous rocks began to develop after the parent rock weathered into permeable material. The thickness and development of other characteristics of the A and B horizons reflect the relative age of the soil.

The soils in this survey area range from a few years old to possibly a few hundred thousand years in

age. This range in age is a major reason for the many kinds of soils in the survey area.

The interrelations between time and the other soil-forming factors are not well understood by soil scientists and geologists working in this field. Many soil scientists and geologists feel that weathering of parent material and soil profile development have been essentially continuous, with little change in rate, throughout Quaternary time (11, 12, 14, 18). Recently, earth scientists concerned with differentiating Quaternary deposits have proposed that soil development has not proceeded continuously at the same rate, but has taken place intermittently at rapid rates (8, 9, 10, 14). Concepts of soil stratigraphy use weathering profiles as stratigraphic markers to differentiate and correlate Quaternary deposits. These concepts of soil development are based on the assumption that weathering profiles formed in response to infrequent combinations of climatic factors that induced minimal erosion and deposition and a greatly accelerated rate of chemical weathering. Although disagreements exist in regard to the relative influences of time and other soil-forming factors, the concept of intermittence of soil formation has been supported by numerous studies and provides a practical technique to discuss the age of soils in this survey area in relation to geologic and climatic factors in the Quaternary Period.

The kinds of diagnostic subsurface horizons and other subsurface diagnostic properties, together with their strength of expression, provide general clues to the age of the soils in the area. Important subsurface diagnostic horizons present in soils within the area include argillic, natric, cambic, calcic, and petrocalcic horizons, and horizons exhibiting silica cementation.

Prominent argillic horizons in this area occur generally only in soils formed primarily during the Pleistocene. This concept has been established by studies in the southwest (4, 5) and is further supported in Soil Taxonomy (17). With increasing age and constancy of other conditions, argillic horizons become finer in texture, become somewhat thicker, and tend to develop abrupt upper boundaries. Weakly expressed, thin argillic horizons may have formed during very late Pleistocene or early Holocene time. Soils on the oldest, most stable surface are the most strongly developed. These soils have strong profile development and have considerably more distinct horizons. Xerollic Durargids (Chuckridge and Handpah series) are examples of these soils. Soils of intermediate age also have distinctive horizons. These soils have developed argillic horizons and may have durinodes, strongly developed silica-lime cemented hardpans, or calcic horizons. Duric Haplargids (Unsel series) and Durixerollic Haplargids (Watoopah) are examples of these soils.

Natric horizons are special kinds of argillic horizons that formed under the influence of high exchangeable sodium. The effect of sodium on the dispersion of clay may tend to accelerate the rate of formation of

argillic horizons. This is not believed to be significant however, except in weakly expressed natric horizons that formed on Holocene surfaces. Following the formation of argillic horizons, prominent natric horizons may have developed as a result of sodium supplied by deposition of surficial loess, which is believed to be an important present day process that affects the physical and chemical properties of soils in the area. Duric Natrargids (Ricert) are examples of soils with natric horizons.

Cambic horizons in soils within the area formed, for the most part, on Holocene surfaces. Original stratification is absent, and carbonates have been removed and redeposited in underlying horizons. Investigations in southern New Mexico (5) indicate that cambic horizons in that region are less than 5,000 years old. Cambic horizons in the survey area and in other areas in northern Nevada have been generally thought to be less than 10,000 years old,

and possibly less than 7,000 years. This age has been determined mostly as a result of soil mapping in areas below the last high stage of Pleistocene Lake Lahontan (8, 9, 10, 15). Examples are the soils on fan skirts and alluvial flats that have developed weakly expressed horizons. These may have cambic or thin natric horizons. The lower horizons have an accumulation of calcium carbonates and silica in the form of pendants on the rock fragments. Examples of these soils are Duric Camborthids (Keefa series).

The youngest soils in the area are those which formed in recently transported alluvium or material which has been recently exposed by erosion. Typic Torriorthents (Izo series) is an example of soils which formed in recent alluvium. Typic Torripsamments (Kawich series) were formed in recently deposited eolian sands. These soils have little or no profile development.

## References

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- (1) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.
- (2) American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.
- (3) Fenneman, N.M. 1931. Physiography of the Western United States. McGraw-Hill Co., New York, NY.
- (4) Gile, L. H. and R. B. Grossman. 1968. Morphology of the argillic horizon in desert soils of southern New Mexico. *Soil Sci.* Vol. 106, no. 1: 6-15.
- (5) Gile, L. H. and J. W. Hawley. 1966. Periodic sedimentation and soil formation on an alluvial fan piedmont in southern New Mexico. *Soil Sci. Soc. of Am. Proc.*, vol. 30: 261-268.
- (6) Kleinhampl F. J., Ziony J. I., 1985, *Geology of Northern Nye County, Nevada*, Nevada Bureau of Mines and Geology, University of Nevada, Bulletin 99A, 172pp., illus.
- (7) Meizner, Oscar E. 1917. Geology and water resources of Big Smoky, Clayton and Alkali Spring Valleys, Nevada. U.S. Geol. Surv. Water Supply Paper 423, 167pp., illus.
- (8) Morrison, R. B. 1964. Lake Lahontan: Geology of the Carson Desert, Nevada. U.S. Geol. Surv. Prof. Pap. 401.
- (9) Morrison, R. B. 1964. Soil stratigraphy: Principles, applications to differentiation and correlation of Quaternary deposits and landforms, and applications to soil science. Ph.D. thesis, University of Nevada.
- (10) Morrison, R. B. 1965. Principles of Quaternary soil stratigraphy. In *Quaternary soils, INQA. Proc.* vol. 9, VII Congress: 1-69.
- (11) Nikiforoff, C. C. 1942. Fundamental formula of soil formation. *Am. J. of Sci.*, vol. 240: 847-866.
- (12) Nikiforoff, C. C. 1949. Weathering and soil evolution. *Soil Sci.*, vol. 67: 219-223.
- (13) Peterson, Frederick F. 1981. Landforms of the Basin and Range province defined for soil survey. Nevada Agricultural Experiment Station, Max C. Fleischmann College of Agriculture, University of Nevada, Reno. Tech. bul. 28: 52 pp., illus.
- (14) Richmond, G. M. 1962. Quaternary geology of the La Sal Mountains, Utah. U. S. Geol. Surv. Prof. Pap. 324.
- (15) Springer, M.E. 1953. Soil formation in the desert of the Lahontan Basin, Nevada. Ph.D. thesis, Univ. Calif.
- (16) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18. (Supplements replacing pp. 173-188 issued May 1962.)
- (17) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. *Soil Conserv. Serv.*, U.S. Dep. Agric. Handb. 436.
- (18) Ward, W. T. 1965. Soils of the Adelaide Area, South Australia, in relation to time. In *Quaternary soils, INQA. Proc.*, vol. 9, VII Congress: 293-306.
- (19) United States Department of Agriculture. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210.



# Glossary

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**Aeration, soil.** The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

**Aggregate, soil.** Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

**Alkali (sodic) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Alluvial cone.** The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

**Alluvial fan.** The fanlike deposit of a stream where it issues from a narrow valley upon a plain, or of a tributary stream near or at its junction with its main stream.

**Alluvial flat.** A nearly level, graded, alluvial surface in bolsons and semi-bolsons. Commonly, an alluvial flat does not manifest terraces or floodplain levels.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Alpha,alpha-dipridyl.** A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

**Animal unit month (AUM).** The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

**Aquic conditions.** Current soil wetness characterized by saturation, reduction, and redoximorphic features.

**Area reclaim (in tables).** An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Argillic horizon.** A subsoil horizon characterized by an accumulation of illuvial clay.

**Argillite.** Weakly metamorphosed mudstone or shale.

**Arroyo.** The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

**Aspect.** The direction in which a slope faces.

**Association, soil.** A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

**Available water capacity (available moisture capacity).**

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low .....	0 to 3.5
Low .....	3.5 to 5
Moderate.....	5 to 7.5
High .....	more than 7.5

**Avalanche chute.** The track or path formed by an avalanche.

**Back slope.** The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

**Backswamp.** A floodplain landform of extensive, marshy, or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

**Badland.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

**Ballena.** A fan remnant having a distinctively-rounded surface of fan alluvium. The ballena's broadly rounded shoulders meet from either side to form a narrow summit and merge smoothly with concave, short pediments which form smoothly-rounded drainageways between adjacent ballenas. A partial

- ballena is a fan remnant large enough to retain some relict fan surface on a remnant summit.
- Barrier beach.** A wide gently sloping portion of a bolson floor comprising numerous, parallel, relict longshore-bars and lagoons built by a receding pluvial lake.
- Basal area.** The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.
- Base saturation.** The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.
- Basin floor.** A general term for the nearly level, lowermost part of intermontane basins (i.e., bolson, semi-bolsos). The basin floor includes all of the alluvial, eolian, and erosional landforms below the piedmont slope.
- Beach terrace.** The relict shorelines from pluvial lakes, generally restricted to valley sides.
- Bedding planes.** Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.
- Bedding system.** A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.
- Bedrock.** The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
- Bedrock-controlled topography.** A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.
- Bench terrace.** A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.
- Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.
- Blowout.** A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts, the water table is exposed.
- Board foot.** A unit of measure of the wood in lumber, logs, or trees. The amount of wood in a board one foot wide, one foot long, and one inch thick before finishing.
- Bolson.** A landscape term for an internally drained intermontane basin into which drainages from surrounding mountains converge inward toward a central depression.
- Boulders.** Rock fragments larger than 2 feet (60 centimeters) in diameter.
- Breaks.** The steep and very steep broken land at the border of an upland summit that is dissected by ravines.
- Breast height.** An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.
- Brush management.** Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.
- Butte.** An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.
- Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.
- Caldera.** A large, more or less circular depression, formed by explosion and/or collapse, which surrounds a volcanic vent or vents, and whose diameter is much greater than that of the included vent, or vents.
- Caliche.** A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.
- California bearing ratio (CBR).** The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.
- Canopy.** The leafy crown of trees or shrubs. (See Crown.)
- Canyon.** A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.
- Capillary water.** Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.
- Catena.** A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but

have different characteristics as a result of differences in relief and drainage.

**Cation.** An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

**Channeled.** Refers to a drainage area in which natural meandering or repeated branching and convergence of a streambed have created deeply incised cuts, either active or abandoned, in alluvial material.

**Channery soil material.** Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

**Chemical treatment.** Control of unwanted vegetation through the use of chemicals.

**Chiseling.** Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay depletions.** Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

**Clayey soil.** Silty clay, sandy clay, or clay.

**Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

**Claypan.** A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

**Clearcut.** A method of forest harvesting that removes the entire stand of trees in one cutting. Reproduction is achieved artificially or by natural seeding from adjacent stands.

**Climax plant community.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Closed depression.** A low area completely surrounded by higher ground and having no natural outlet.

**Coarse fragments.** Mineral or rock particles larger than 2 millimeters in diameter.

**Coarse textured soil.** Sand or loamy sand.

**Cobble (or cobblestone).** A rounded, partly rounded, or angular fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

**Cobbly soil material.** Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.

**Codominant trees.** Trees whose crowns form the general level of the forest canopy and that receive full light from above but comparatively little from the sides.

**Colluvium.** Unconsolidated, unsorted earth material moved and deposited by mass movement on sideslopes and at the base of slopes.

**Commercial forest.** Forest land capable of producing 20 cubic feet or more per acre per year at the culmination of mean annual increment.

**Complex slope.** Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

**Complex, soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

**Compressible (in tables).** Excessive decrease in volume of soft soil under load.

**Concretions.** Cemented bodies with crude internal symmetry organized around a point, a line, or a plane that typically takes the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

**Conglomerate.** A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

**Conservation cropping system.** Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-

improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

**Conservation tillage.** A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

**Consistence, soil.** Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

**Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

**Control section.** The part of the soil on which classification is based. The thickness varies among different kinds of soil, but, for many, it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

**Coprogenous earth (sedimentary peat).** Fecal material deposited in water by aquatic organisms.

**Corrosion.** Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Cropping system.** Growing crops according to a planned system of rotation and management practices.

**Crop residue management.** Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

**Cross-slope farming.** Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

**Crown.** The upper part of a tree or shrub, including the living branches and their foliage.

**Cuesta.** A hill or ridge that has a gentle slope on one side and a steep slope on the other; specifically, an asymmetric, homoclinal ridge capped by resistant rock layers of slight or moderate dip.

**Culmination of the mean annual increment (CMAI).** The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of

the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

**Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.

**Decreasers.** The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

**Deep soil.** A soil that is 40 to 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Deferred grazing.** Postponing grazing or resting grazing land for a prescribed period.

**Delta.** A body of alluvium having a surface that is nearly flat and fan shaped, deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

**Dense layer** (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

**Depth, soil.** Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

**Depth to rock** (in tables). Bedrock is too near the surface for the specified use.

**Desert pavement.** On a desert surface, a layer of gravel or larger fragments that was emplaced by upward movement of the underlying sediments or that remains after finer particles have been removed by running water or the wind.

**Dip slope.** A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**Divided-slope farming.** A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

**Dominant trees.** Trees whose crowns form the general level of the forest canopy and that receive full light from above and from the sides.

**Drainage class (natural).** Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized: excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Drainageway.** An area of ground at a lower elevation than the surrounding ground and in which water collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may or may not have distinctly incised channels at its upper reaches or throughout its course.

**Duff.** A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

**Dune.** A mound, ridge, or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

**Ecological Site.** A distinctive kind of rangeland or grazed forestland that has a unique historic potential native plant community. Ecological sites are the products of all the environmental factors that affect their development. An ecological site is capable of supporting a native plant community that has a unique kind and/or proportion of species or total vegetative production. Ecological sites in grazed forestland include both overstory and understory vegetation.

**Effervescence.** The quality of a soil measured when drops of diluted (1:10) hydrochloric acid (HCL) are added to the soil. The ratings are as follows:

- Very slightly effervescent..... few bubbles
- Slightly effervescent..... bubbles readily
- Strongly effervescent.....bubbles form low foam
- Violently effervescent ..... bubbles form thick foam quickly

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Endosaturation.** A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

**Eolian soil material.** Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

**Ephemeral stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

**Episaturation.** A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion (geologic).* Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion (accelerated).* Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

**Erosion pavement.** A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

**Escarpment.** A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

**Even aged.** Refers to a stand of trees in which only small differences in age occur between the individuals. A range of 20 years is allowed.

**Excess alkali (in tables).** Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

**Excess fines (in tables).** Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

**Excess lime (in tables).** Excess carbonates in the soil that restrict the growth of some plants.

**Excess salts (in tables).** Excess water-soluble salts in the soil that restrict the growth of most plants.

**Excess sodium (in tables).** Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

**Excess sulfur (in tables).** Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

**Extrusive rock.** Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

- Fallow.** Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.
- Fan apron.** A sheet-like mantle of relatively young alluvium covering part of an older fan piedmont surface. It somewhere buries a soil that can be traced to the edge of the fan apron.
- Fan piedmont.** The most extensive landform on piedmont slopes, formed by the coalescence of alluvial fans or accretions of fan aprons into one generally smooth slope.
- Fan remnant.** A general term for landforms that are remaining parts of older fan-landforms, that either have been dissected or partially buried.
- Fan skirt.** The zone of smooth, laterally-coalescing, small alluvial fans that issue from gullies cut into the fan piedmont or that are the coalescing extensions of inset fans of the fan piedmont, and that merge with the basin floor.
- Fast intake** (in tables). The rapid movement of water into the soil.
- Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
- Fibric soil material (peat).** The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.
- Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.
- Fill slope.** A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.
- Fine textured soil.** Sandy clay, silty clay, or clay.
- Firebreak.** An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of fire fighters and equipment. Designated roads also serve as firebreaks.
- First bottom.** The normal flood plain of a stream, subject to frequent or occasional flooding.
- Flaggy soil material.** Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material is 35 to 60 percent flagstones, and extremely flaggy soil material is more than 60 percent flagstones.
- Flagstone.** A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.
- Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.
- Fluvial.** Of or pertaining to rivers; produced by river action, as a fluvial plain.
- Foothill.** A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.
- Foot slope.** The inclined surface at the base of a hill.
- Forb.** Any herbaceous plant not a grass or a sedge.
- Forest cover.** All trees and other woody plants (underbrush) covering the ground in a forest.
- Fragile** (in tables). A soil that is easily damaged by use or disturbance.
- Frost action** (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.
- Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.
- Gilgai.** The microrelief of clayey soils that shrink and swell considerably with changes in moisture content. Usually manifested as a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope.
- Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.
- Graded stripcropping.** Growing crops in strips that grade toward a protected waterway.
- Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.
- Gravel.** Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.
- Gravelly soil material.** Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.
- Green manure crop** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.
- Ground water.** Water filling all the unblocked pores of underlying material below the water table.
- Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only

after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Gypsum.** A mineral consisting of hydrous calcium sulfate.

**Hard bedrock.** Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Heavy metal.** Inorganic substances that are solid at ordinary temperatures and are not soluble in water. They form oxides and hydroxides that are basic. Examples are copper, iron, cadmium, zinc, manganese, lead, and arsenic.

**Hemic soil material (mucky peat).** Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

**High-residue crops.** Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

**Hill.** A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

**Holocene.** The epoch of the Quaternary Period of geologic time, extending from the end of the Pleistocene Epoch (about 10 to 12 thousand years ago) to the present.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons of mineral soil are as follows:

*O horizon.*--An organic layer of fresh and decaying plant residue.

*A horizon.*--The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon.*--The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

*B horizon.*--The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

*C horizon.*--The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

*Cr horizon.*--Soft, consolidated bedrock beneath the soil.

*R layer.*--Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

**Igneous rock.** Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

**Illuviation.** The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

**Impervious soil.** A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

**Increasesers.** Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasesers commonly are the shorter plants and less palatable to livestock.

**Infiltration.** The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

**Infiltration capacity.** The maximum rate at which water can infiltrate into a soil under a given set of conditions.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Inset fan.** A special case of the flood plain of an ephemeral stream that is confined between fan remnants, basin-floor remnants, ballenas, or closely opposed fan toeslopes.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2.....	very low
0.2 to 0.4.....	low
0.4 to 0.75.....	moderately low
0.75 to 1.25.....	moderate
1.25 to 1.75.....	moderately high
1.75 to 2.5.....	high
More than 2.5.....	very high

**Intermittent stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives groundwater discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Intermontane basin.** A generic term for wide structural depressions between mountain ranges that are partly filled with alluvium. They may be drained internally (bolsons) or externally (semi-bolsons).

**Invaders.** On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

**Iron depletions.** Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are:  
*Basin.*--Water is applied rapidly to nearly level plains surrounded by levees or dikes.  
*Border.*--Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes or borders.  
*Controlled flooding.*--Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation.*--Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Drip (or trickle).*--Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

*Furrow.*--Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

*Sprinkler.*--Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

*Subirrigation.*--Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

*Wild flooding.*--Water, released at high points, is allowed to flow onto an area without controlled distribution.

**Lacustrine deposit.** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Lagoon.** The nearly level, filled depression behind the longshore bar on a barrier beach.

**Lake plain.** A surface marking the floor of an extinct lake, filled in by well sorted, stratified sediments.

**Lake terrace.** The narrow shelf produced along a lake shore and later exposed when the water recedes.

**Lamella.** A thin, generally horizontal layer of fine material illuviated within a very much thicker, coarser, eluviated layer.

**Landform.** Any recognizable form or feature on the earth's surface, having a characteristic shape, and produced by natural causes that provide an empirical description of similar portions of the earth's surface.

**Landscape.** A collection of related, natural landforms.

**Landslide.** The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

**Large stones (in tables).** Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble material from soil or other material by percolating water.

**Liquid limit.** The moisture content at which the soil passes from a plastic to a liquid state.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Loamy soil.** Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

- Loess.** Fine grained material, dominantly of silt-sized particles, deposited by wind.
- Longshore bar.** A narrow, elongate, coarse-textured ridge, built by the wave action of a pluvial lake, that extends parallel to the shore and separated it from a lagoon; both the bar and lagoon are now relict features.
- Low-residue crops.** Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.
- Low strength.** The soil is not strong enough to support loads.
- Marl.** An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.
- Masses.** Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.
- Mean annual increment (MAI).** The average annual increase in volume of a tree during the entire life of the tree.
- Mechanical treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.
- Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.
- Merchantable trees.** Trees that are of sufficient size to be economically processed into wood products.
- Metamorphic rock.** Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.
- Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.
- Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.
- Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.
- Moderately coarse textured soil.** Coarse sandy loam, sandy loam, or fine sandy loam.
- Moderately deep soil.** A soil that is 20 to 40 inches deep over bedrock or to other material that restricts the penetration of plant roots.
- Moderately fine textured soil.** Clay loam, sandy clay loam, or silty clay loam.
- Mollic epipedon.** A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.
- Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.
- Mottling, soil.** Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance--*few, common, and many*; size--*fine, medium, and coarse*; and contrast--*faint, distinct, and prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).
- Mountain.** A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.
- Muck.** Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)
- Mudstone.** Sedimentary rock formed by induration of silt and clay in approximately equal amounts.
- Munsell notation.** A designation of color by degrees of three simple variables--hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.
- Natric horizon.** A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.
- Neutral soil.** A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)
- Nodules.** Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.
- Nutrient, plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.
- Observed rooting depth.** Depth to which roots have been observed to penetrate.
- Organic matter.** Plant and animal residue in the soil in various stages of decomposition.

**Overstory.** The trees in a forest that form the upper crown cover.

**Oxbow.** The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

**Pan.** A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Parna dune.** An eolian dune built of sand size aggregates of clayey material that commonly occurs leeward of a playa.

**Peat.** Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

**Ped.** An individual natural soil aggregate, such as a granule, a prism, or a block.

**Pediment.** A gently sloping erosional surface developed at the foot of a receding hill or mountain slope.

**Pedisediment.** A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Percs slowly** (in tables). The slow movement of water through the soil adversely affects the specified use.

**Permeability.** The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow .....	0.00 to 0.01 inch
Very slow .....	0.01 to 0.06 inch
Slow .....	0.06 to 0.2 inch
Moderately slow .....	0.2 to 0.6 inch
Moderate .....	0.6 inch to 2.0 inches
Moderately rapid .....	2.0 to 6.0 inches
Rapid .....	6.0 to 20 inches
Very rapid .....	more than 20 inches

**Phase, soil.** A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

**pH value.** A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

**Piedmont slope.** The dominant slope at the foot of a mountain. Main components of the piedmont slope include pediments, alluvial fans, fan piedmonts, fan skirts and inset fans.

**Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

**Pitting** (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

**Plasticity index.** The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit.** The moisture content at which a soil changes from semisolid to plastic.

**Plateau.** An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

**Playa.** The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

**Pleistocene.** The epoch of the Quaternary Period of geologic time preceding the Holocene (from approximately 2 million to 10 thousand years ago).

**Plowpan.** A compacted layer formed in the soil directly below the plowed layer.

**Pluvial.** Relating to former periods of abundant rains.

**Ponding.** Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poor filter** (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Poor outlets** (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

**Potential native plant community.** See Climax plant community.

**Potential rooting depth (effective rooting depth).** Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no

properties restricting the penetration of roots to this depth.

**Prescribed burning.** Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

**Productivity, soil.** The capability of a soil for producing a specified plant or sequence of plants under specific management.

**Profile, soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Proper grazing use.** Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

**Quartzite, metamorphic.** Rock consisting mainly of quartz that formed through recrystallization of quartz-rich sandstone or chert.

**Quaternary.** The period of geologic time, extending from about 2 million years ago to the present and comprising two epochs, the Pleistocene (Ice Age) and Holocene (Recent).

**Quartzite, sedimentary.** Very hard but unmetamorphosed sandstone consisting chiefly of quartz grains.

**Range condition.** The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Range site.** An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

**Reaction, soil.** A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid..... less than 3.5  
Extremely acid..... 3.5 to 4.4

Very strongly acid..... 4.5 to 5.0  
Strongly acid..... 5.1 to 5.5  
Moderately acid..... 5.6 to 6.0  
Slightly acid..... 6.1 to 6.5  
Neutral..... 6.6 to 7.3  
Slightly alkaline..... (mildly alkaline) 7.4 to 7.8  
Moderately alkaline..... 7.9 to 8.4  
Strongly alkaline..... 8.5 to 9.0  
Very strongly alkaline..... 9.1 and higher

**Redoximorphic concentrations.** Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

**Redoximorphic depletions.** Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

**Redoximorphic features.** Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

**Reduced matrix.** A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

**Regeneration.** The new growth of a natural plant community, developing from seed.

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

**Relict stream terrace.** One of a series of platforms in or adjacent to a stream valley that formed prior to the current stream system.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Residuum (residual soil material).** Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

**Rill.** A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

**Riverwash.** Unstable areas of sandy, silty, clayey, or gravelly sediments. These areas are flooded, washed, and reworked by rivers so frequently that they support little or no vegetation.

**Road cut.** A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rock outcrop.** Exposures of bare bedrock other than lava flows and rock-lined pits.

**Rooting depth** (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

**Root zone.** The part of the soil that can be penetrated by plant roots.

**Rubble land.** Areas that have more than 90 percent of the surface covered by stones or boulders. Voids contain no soil material and virtually no vegetation other than lichens. The areas commonly are at the base of mountain slopes, but some are on mountain slopes as deposits of cobbles, stones, and boulders left by Pleistocene glaciation or by periglacial phenomena.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from ground water.

**Saline soil.** A soil containing soluble salts in an amount that impairs the growth of plants. A saline soil does not contain excess exchangeable sodium.

**Salinity.** The electrical conductivity of a saline soil. It is expressed, in millimhos per centimeter, as follows:

Nonsaline .....	0 to 2
Very slightly saline.....	2 to 4
Slightly saline.....	4 to 8
Moderately saline.....	8 to 16
Strongly saline.....	More than 16

**Salty water** (in tables). Water that is too salty for consumption by livestock.

**Sand.** As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sand sheet.** A large, irregularly shaped, surficial mantle of eolian sand.

**Sandstone.** Sedimentary rock containing dominantly sand-sized particles.

**Sandy soil.** Sand or loamy sand.

**Sapric soil material (muck).** The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

**Saprolite.** Unconsolidated residual material underlying the soil and grading to hard bedrock below.

**Saturation.** Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

**Sawlogs.** Logs of suitable size and quality for the production of lumber.

**Scarification.** The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

**Scribner's log rule.** A method of estimating the number of board feet that can be cut from a log of a given diameter and length.

**Second bottom.** The first terrace above the normal flood plain (or first bottom) of a river.

**Sedimentary rock.** Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Seepage** (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

**Semi-bolson.** An intermontane basin that is drained externally by an intermittent stream.

**Sequum.** A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

**Series, soil.** A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Shale.** Sedimentary rock formed by the hardening of a clay deposit.

**Shallow soil.** A soil that is 10 to 20 inches deep over bedrock or to other material that restricts the penetration of plant roots.

**Sheet erosion.** The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

**Shelterwood system.** A forest management system requiring the removal of a stand in a series of cuts so that regeneration occurs under a partial canopy. After regeneration, a final cut removes the shelterwood and allows the stand to develop in the open as an even-aged stand. The system is well suited to sites where shelter is needed for regeneration, and it can aid regeneration of the more intolerant tree species in a stand.

**Shoulder slope.** The uppermost inclined surface at the top of a hillside. It is the transition zone from the back slope to the summit of a hill or mountain. The surface is dominantly convex in profile and erosional in origin.

**Shrink-swell** (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Shrub-coppice dune.** A small dune that forms around shrubs or small trees.

**Silica.** A combination of silicon and oxygen. The mineral form is called quartz.

**Silt.** As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**Similar soils.** Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

**Sinkhole.** A depression in the landscape where limestone has been dissolved.

**Site class.** A grouping of site indexes into five to seven production capability levels. Each level can be represented by a site curve.

**Site curve (50-year).** A set of related curves on a graph that shows the average height of dominant or dominant and codominant trees for the range of ages on soils that differ in productivity. Each level is represented by a curve. The basis of the curves is the height of dominant or dominant and codominant trees that are 50 years old or are 50 years old at breast height.

**Site curve (100-year).** A set of related curves on a graph that shows the average height of dominant or dominant and codominant trees for a range of ages on soils that differ in productivity. Each level is represented by a curve. The basis of the curves is the height of dominant or dominant and codominant trees that are 100 years old or are 100 years old at breast height.

**Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

**Skid trails.** Pathways along which logs are dragged to a common site for loading onto a logging truck.

**Slash.** The branches, bark, treetops, reject logs, and broken or uprooted trees left on the ground after logging.

**Slickens.** Accumulations of fine-textured material, such as material separated in placer-mine and ore-mill operations. Slickens from ore mills commonly consist of freshly ground rock that has undergone chemical treatment during the milling process.

**Slickensides.** Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

**Slick spot.** A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

**Slippage (in tables).** Soil mass susceptible to movement downslope when loaded, excavated, or wet.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, the following slope classes are recognized:

Nearly level .....	0 to 2 percent
Gently sloping .....	2 to 4 percent
Moderately sloping .....	4 to 8 percent
Strongly sloping.....	8 to 15 percent
Moderately steep.....	15 to 30 percent
Steep .....	30 to 50 percent
Very steep.....	50 to 75 percent
Extremely steep .....	75 percent and higher

**Slope (in tables).** Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

**Slow intake (in tables).** The slow movement of water into the soil.

**Slow refill (in tables).** The slow filling of ponds, resulting from restricted permeability in the soil.

**Small stones (in tables).** Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

**Sodic (alkali) soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of  $Na^+$  to  $Ca^{++} + Mg^{++}$ . The degrees of sodicity and their respective ratios are:

Very slight.....	5-12:1
Slight.....	13-30:1
Moderate.....	31-45:1
Strong .....	46-90:1
Very strong.....	more than 90:1

**Soft bedrock.** Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.05
Silt .....	0.05 to 0.002
Clay .....	less than 0.002

**Solum.** The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

**Species.** A single, distinct kind of plant or animal having certain distinguishing characteristics.

**Stone line.** A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

**Stony.** Refers to a soil containing stones in numbers that interfere with or prevent tillage.

**Strath terrace.** A surface cut formed by the erosion of hard or semiconsolidated bedrock and thinly mantled with stream deposits.

**Stream channel.** The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

**Stream terrace.** One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel. It originally formed near the level of the stream and is the dissected remnants of an abandoned flood plain, streambed, or valley floor that were produced during a former stage of erosion or deposition.

**Stripcropping.** Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing and water erosion.

**Structure, soil.** The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are: *platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Any surface soil horizon (A, E, AB, or EB) below the surface layer.

**Summer fallow.** The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

**Summit.** A general term for the top, or highest level, of an upland feature, such as a hill or mountain. It commonly refers to a higher area that has a gentle slope and is flanked by steeper slopes.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer" or the "Ap horizon."

**Surface soil.** The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

**Tailwater.** The water directly downstream of a structure.

**Talus.** Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

- Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.
- Terrace** (geologic). A step-like surface, ordinarily flat or undulating, bordering a river, a lake, or the sea representing a former flood plain.
- Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."
- Thin layer** (in tables). Otherwise suitable soil material too thin for the specified use.
- Till plain.** An extensive area of nearly level to undulating soils underlain by glacial till.
- Tilth, soil.** The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.
- Toe slope.** The outermost inclined surface at the base of a hill; part of a foot slope.
- Too arid** (in tables). The soil is dry most of the time, and vegetation is difficult to establish.
- Topsoil.** The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.
- Toxicity** (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.
- Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.
- Trafficability.** The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.
- Tread.** The relatively flat terrace surface that was cut or built by stream or wave action.
- Tuff.** A compacted deposit that is 50 percent or more volcanic ash and dust.
- Understory.** Any plants in a forest community that grow to a height of less than 5 feet.
- Unstable fill** (in tables). Risk of caving or sloughing on banks of fill material.
- Upland** (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.
- Valley.** An elongated depressional area primarily developed by stream action.
- Valley fill.** In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.
- Variation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.
- Very deep soil.** A soil that is more than 60 inches deep over bedrock or to other material that restricts the penetration of plant roots.
- Very shallow soil.** A soil that is less than 10 inches deep over bedrock or to other material that restricts the penetration of plant roots.
- Water bars.** Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.
- Waterspreading.** Diverting runoff from natural channels by means of a system of dams, dikes, or ditches and spreading it over relatively flat surfaces.
- Water supplying capacity.** The total amount of water available in the soil for plant growth in a normal year from precipitation and from runoff from higher areas. Runoff and water lost to deep percolation are not included.
- Weathering.** All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.
- Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.
- Wilting point (or permanent wilting point).** The moisture content of soil, on an oven-dry basis, at which a plant (specifically, a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.
- Windthrow.** The uprooting and tipping over of trees by the wind.



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