United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with United States Department of the Interior, Bureau of Indian Affairs; the New Mexico Agricultural Experiment Station; and the Jicarilla Apache Nation

Soil Survey of Jicarilla Apache Nation, New Mexico,

Parts of Rio Arriba and Sandoval Counties

How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

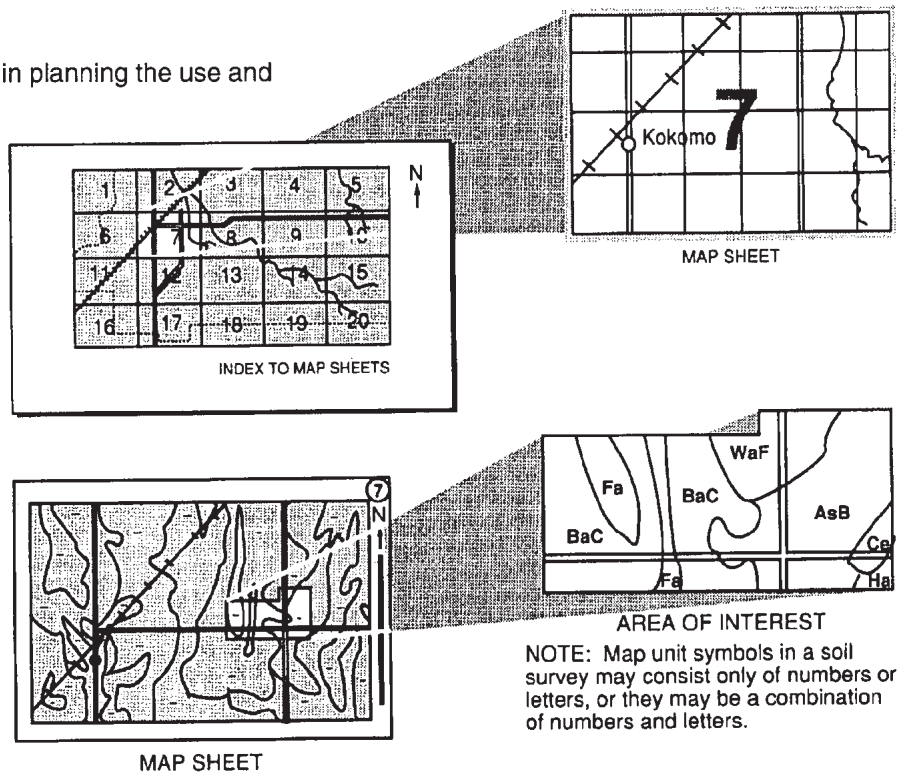
Detailed Soil Maps

The detailed soil maps 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 **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

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



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey was made by the United States Department of the Interior, Bureau of Indian Affairs in cooperation with the United States Department of Agriculture, Natural Resources Conservation Service, and the New Mexico Agriculture Experiment Station. It is part of the technical assistance furnished to the Jicarilla Apache Nation and the Upper Chama Soil and Water Conservation District.

Major fieldwork for this survey was completed from 1982 to 1999. Soil names and descriptions were approved in 2000. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2000. 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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Cover: View of Dulce Rock near Dulce, New Mexico, headquarters of the Jicarilla Apache Nation.

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Foreword

This soil survey contains information that affects land use planning in the Jicarilla Apache Nation, Parts of Rio Arriba and Sandoval Counties survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, 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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

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 buildings 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. Broad areas of soils are shown on the general soil map. 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 or the Cooperative Extension Service.

Rosendo Trevino III
State Conservationist
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Soil Survey of Jicarilla Apache Nation, New Mexico, Parts of Rio Arriba and Sandoval Counties

By Timothy R. Overdier, Bureau of Indian Affairs

Fieldwork by Henry E. Bulloch, Douglas Deikman, Todd Ellsworth, Robert Hetzler, Paul Hobbs, Timothy R. Overdier, Cy Sokoll, and Dale Swanson

United States Department of Agriculture, Natural Resources Conservation Service, and United States Department of the Interior, Bureau of Indian Affairs, in cooperation with the New Mexico Agriculture Experiment Station and the Jicarilla Apache Nation

THE JICARILLA APACHE NATION, PARTS OF RIO ARRIBA AND SANDOVAL COUNTIES, survey area is in northwestern New Mexico and occupies portions of Rio Arriba and Sandoval Counties. The survey area is situated in the the headwater region of the San Juan and Upper Rio Grande Rivers. It has a total of 837,155 acres or 1,308 square miles. The Jicarilla Apache Nation headquarters and population center are located at the community of Dulce in the northeast portion. El Poso and Theis Ranches are included in this survey. Soils information for the Willow Creek Ranch, Chama Land and Cattle Company (Running Elk Ranch), and other lands purchased by the Jicarilla Apache Nation may be found in the Rio Arriba or Sandoval County Soil Surveys.

In 1969, the Bureau of Indian Affairs completed a Soil and Range Inventory of the Jicarilla Apache Reservation that covered the original reservation. This survey provides the first taxonomic classification of soils and provides additional soil interpretive information and larger-scale maps. Soil scientists have identified 61 different named soils in the survey area. Each series may include various slopes, textures, aspects, and other features. Descriptions and named components in some delineations in this soil survey do not fully agree with those on soil maps from adjacent survey areas. Differences are the results of better knowledge of soils, modifications in series concepts, intensity of mapping, or the extent of soils within the survey. The most practical join has been made with the Rio Arriba County Soil Survey and the Sandoval County Soil Survey. Use and management are essentially the same for soils that join across the adjacent areas.

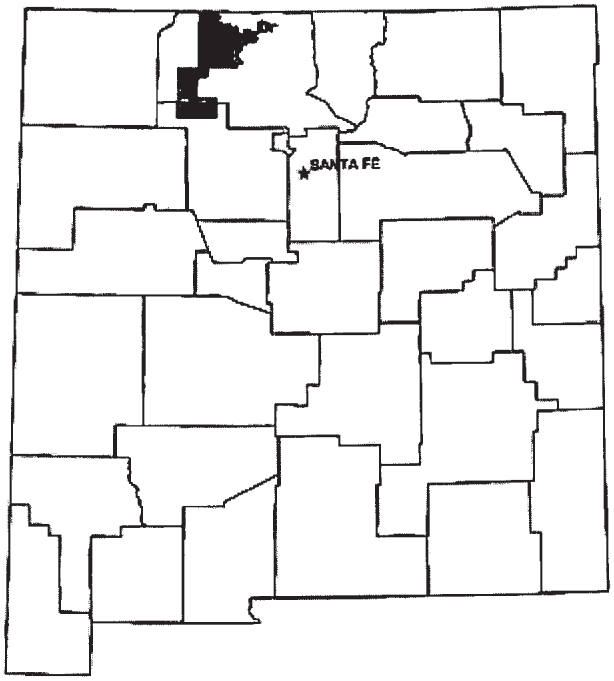

Figure 1.—Location of the Jicarilla Apache Nation in New Mexico

General Nature of the Area

The survey area is bordered on the north by Colorado, on the west by the Carson National Forest, on the east by Rio Arriba County and the Santa Fe National Forest, and on the south by Sandoval County. NM Highway 537 and US Highways 64 and 550 wind

across the survey area. There are only two perennial streams on the reservation, the Navajo River and Willow Creek. The Navajo River traverses the northern part of the survey area from east to west, and Willow Creek traverses the eastern tip of the survey area from north to south.

The Jicarilla landscape varies from rolling expanses of valleys and mesas in the dry southern half to high relief, dissected plateaus, cuestas, mountains, and valleys in the cooler, forested north half. The central portion is a dissected plateau cut by deep arroyos which drain to the west.

Elevations range from about 9,025 feet on Tecolote Rim, the highest point in the survey area, to about 6,450 feet where Largo Wash leaves the survey area west of the old Otero Store site.

Principal land uses in the survey area are livestock grazing, oil and gas production, commercial timber, tourism, hunting, fishing, and in small areas, irrigated hayland. Residential and community development are increasing in the Dulce area.

History

Steve Lacy, Geologist, Natural Resources Conservation Service, assisted with the preparation of this section.

The first people to use the plains, canyonlands, and escarpments of this region were the Paleo-indians. Paleo-indian people were living in this area by 12,000 years before the present (Stuart, 1986). Evidence for this habitation has been recorded at one archaeological site and corroborated with scattered Clovis, Folsom, and Midland points found within the survey area.

The next evidence of settlement is found in the pit houses, pueblos, and cliff dwellings of the Anasazi. The Anasazi period extends for 900 years from A.D. 400 through 1300. The Anasazi lifestyle consisted of small groups that lived together, farming and hunting foods in the surrounding areas. Initially these villages were pit houses, and the people hunted with atlatls (dart throwers). Sometime between A.D. 400 and 700, the Anasazi began to produce fired pottery and use the bow and arrow. Between 700 and 900, the Anasazi began to build above-ground dwellings with contiguous walls called jacals (adobe mud between wooden posts), and between 900-1100, construction of the dwellings changed from jacal to coursed stone masonry. Pottery became more specialized, farming techniques improved, and the size of the villages increased.

After several centuries of population increase, climatic and resource availability changed for the worse. The Anasazi began to disperse to the south and west, and by 1350, they had left this region for the better-watered areas of the Rio Grande valley. The Utes and the Navajo entered the area around 1540. The remains of early Navajo dwellings have been found in the Gobernador area.

In A.D. 1598, the Spanish settled at the confluence of the Rio Chama and the Rio Grande. Their settlement, named San Gabriel, existed until the formation of Santa Fe in 1610. The Spanish began missionary activity among the Pueblo Indians, and by 1630, they had formed 25 missions throughout northwestern New Mexico and northeastern Arizona. The Spanish mission system flourished for half a century before the Spanish were driven out of the area during the Pueblo uprising of 1680. After the Spanish returned in 1693, they began to establish trade with the Ute Indians found in present day Colorado. A major trail system used by the traders crosses through the soil survey area.

On July 29, 1776, Fray Silvestre Velez de Escalante, a priest from the Zuni mission, led a party of six soldiers and two priests from Santa Fe to establish a land route between the New Mexico missions and the California missions (Moody, 1973). In an attempt to avoid the arid regions of western New Mexico, he followed a portion of the old slave trail. The group traveled for five months, becoming the first explorers to describe the area between the Rocky Mountains and Wasatch Mountains. Although they did not reach their desired destination, they did open the region to further exploration and established the beginnings of the Old Spanish Trail. These early explorers traversed the northern portion of the survey area, crossing the Continental Divide near Horse Lake.

Spanish population began to increase drastically between 1752 and 1800. The number of residents increased from 3,400 to around 25,000 individuals. The village of Abiquiu was established to act as a buffer against the marauding tribes that attacked the Spanish settlements. The area to the north and west of Abiquiu was still inhabited by Navajo and Ute Indians. Some Spanish traders continued to travel into the area. In November, 1829, a party of 30 men led by Antonio Armijo left Abiquiu and traveled to California using the Old Spanish Trail. American fur trappers, known as mountain men, also used the trail to travel to the western beaver streams across the western area.

Between 1821 and 1846, the Spanish frontier expanded westward from the Chama Valley towards the San Juan River. Fear of American encroachment led New Mexico governor Manuel Armijo to issue massive land grants to New Mexican citizens to keep as much land in Mexican hands as possible. In 1832,

he issued the Tierra Amarilla Grant, granting a total of 525,515 acres on lands near the Rio Brazos and the Rio Chama.

In the 17th, 18th, and 19th centuries, the Jicarilla used a large area of land ranging from the northern part of the current Apache Nation east to Southeastern Colorado and south along the Canadian River in New Mexico. They had permanent villages in the mountains, where they grew crops and gathered wild foods (Nordhaus, 1995).

The establishment of the controversial Maxwell Land Grant in 1841 in northeastern New Mexico opened the doors to the displacement of the Jicarilla Apache, who had moved into the area after being driven from the eastern plains and foothills by the Comanche in 1716 (Velarde-Tiller, 1992). By 1848, settlers from the United States began to move onto traditional Jicarilla lands and established cattle and sheep ranches, mines, and lumber operations. The Jicarillas fought the settlers but eventually signed a peace treaty in 1851. The Jicarillas were given an agricultural program near Abiquiu, but the United States government soon cut off the funding, forcing the Jicarillas to fend for themselves. In March of 1854, they defeated a troop of dragoons from Fort Burgwin and were forced to move into the upper Chama Valley near present-day Tierra Amarilla.

By 1870, all of New Mexico's Indians were on reservations except for the Jicarillas. In 1883, they were removed from their homeland and forced to live with the Mescalero Apaches in Sierra Blanca. In 1887, the government gave the Jicarillas their own reservation in north-central New Mexico. The Jicarillas earned revenue through timber sales. They were given a southern addition to the reservation in 1907, enabling them to begin a cattle operation. The coming of the narrow gauge railroad coincided with the timber activity, and the railroad remained a means of transportation through Dulce until the mid-1950's. The discovery of oil and gas in the 1950's greatly increased the nation's revenues. The Jicarilla Apache Nation has currently been expanded to over 875,000 acres through recent land acquisitions on the east side of the original reservation.

Climate

Dr. Greg Johnson, Applied Climatologist, Natural Resources Conservation Service, National Water and Climate Center, Portland, Oregon, assisted with the preparation of this section.

Climate tables were created from climate stations at Chama, Dulce, El Vado, Lybrook, and Tierra Amarilla, New Mexico. Additional precipitation and temperature information was obtained from monthly and annual maps derived from the PRISM modeling system.

Thunderstorm days, relative humidity, percentage of sunshine, and wind information are estimated from First Order station, Albuquerque, New Mexico.

Table 1 gives data on temperature and precipitation for the survey area as recorded in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 24.9 degrees F, and the average daily minimum temperature is 7.9 degrees. The lowest temperature on record, which occurred at Dulce on December 12, 1961, was -47 degrees. In summer, the average temperature is 62.6 degrees, and the average daily maximum temperature is 82.0 degrees. The highest temperature, which occurred at Dulce on June 25, 1954, was 103 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day 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 in spring and the first freeze in fall.

Average annual precipitation over this survey area ranges from around 12 inches in the southwest section to slightly over 18 inches in the north and east. The average annual total precipitation at Dulce is about 17.89 inches. Of this, about 7.0 inches, or 39 percent, usually falls in June through September. The growing season for most crops falls within this period. The heaviest 1-day precipitation during the period of record was 4.00 inches at Dulce on November 22, 1931, all of which came in the form of snow. Thunderstorms occur on about 41 days each year, and most occur in July and August.

The average seasonal snowfall is 56.5 inches at Dulce. Average seasonal snowfall is slightly less in the southern and westernmost regions of this survey area, and is more likely to be around 30 to 40 inches per year. The greatest snow depth at any one time during the period of record at Dulce was 40 inches, recorded on January 10, 1974. On an average, 58 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 36.0 inches recorded on November 22, 1931.

The average relative humidity in mid-afternoon is about 28 percent. Humidity is higher at night, and the average at dawn is about 60 percent. The sun shines 73 percent of the time in summer and 65 percent in winter. The prevailing wind is from the southwest, but

is strongly influenced locally by topography. Average wind speed is highest, around 12 miles per hour, in April.

Geology and Geomorphology

Steve Lacy, Geologist, Natural Resources Conservation Service, prepared this section.

The Jicarilla Apache Nation is located in northwest New Mexico and covers over 875,000 acres. The continental divide crosses the area from north to south. The Nation is situated along the boundary of the San Juan Basin and the Southern Rocky Mountains. The geomorphic surfaces range from canyonlands and escarpments that have moderate relief (6,500 to 8,000 feet) in the northeastern and eastern sections of the survey area, to broad rolling plains that formed on easily eroded sedimentary rocks to the south and west.

Generally, a monoclinal fold rims the San Juan Basin, separating it from adjacent geologic provinces. The geologic structure that separates the San Juan Basin from the Chama platform is known as the Archuleta anticlinorium (Muhlberger, 1960). This arched belt of folded and broken rocks formed as a result of the Laramide deformation (65 million years before present) with a later Cenozoic accentuation. It forms a connection between the Nacimiento uplift in New Mexico and the San Juan Dome in southwestern Colorado (Hoppe, 1992). The Laramide orogeny is thought to be responsible for the creation of the modern Rocky Mountains. The western edge of the Archuleta anticlinorium is defined by a fault zone which passes through Lumberton and Monero. The trends of the major fault zones and folds of the Archuleta anticlinorium appear to be superimposed on Precambrian and late Paleozoic structural trends. This reflects continuing movement along faulting that occurred at depth in the Precambrian rocks.

The rock formations seen on the nation cover a time span of 140 million years. The oldest rocks are Cretaceous in age and were deposited within the shallow sea or as shoreline deposits (Silver, 1957). The Dakota sandstone is the oldest rock exposed on the nation. It consists of a lower sandstone unit, a middle claystone unit which is not always present, and a upper sandstone unit. It is well sorted, thoroughly cemented with silica, and forms a prominent cliff. The Dakota reflects the advance of the Cretaceous seas upon a fairly regular surface.

The Mancos shale is a body of gray carbonaceous marine mud that was deposited in a deeper portion of a shallow inland sea. Within this unit can be found sandstone lenses scattered erratically throughout the shale. A limestone unit known as the Greenhorn member is found along the lower contact of the Mancos. This unit represents deposits of calcareous mud laid down in the inland sea during a highly lime-productive era of a warmer climate when the terrigenous materials were in low supply.

The Mesaverde Group is applied to the regressive and transgressive wedges of sandstone and associated floodplain deposits which intertongue with the Mancos and Lewis shales. These materials consist of interbedded sandstones, shales, and limestones and other Cretaceous-aged sedimentary rocks. The sandstones of the Mesaverde are compound accumulations of barrier island beaches, dune fields, and near-shore sands. The Lewis shale is a sandy gray marine shale which is wedge-shaped, thinning to the southwest. It consists of fine-grained terrigenous sediments deposited in an inland sea. It is similar to the Mancos shale but contains a higher percentage of sand. Sand deposits are found within the shale in some locations.

The Pictured Cliffs sandstone is the uppermost wholly-marine lithologic unit found in the Basin. The coastal deposits from which it formed record the successive positions of the shoreline during the final withdrawal of the Cretaceous seas (Simpson, 1960). On the western edge of the survey area, interfingered within the Pictured Cliffs, is the Fruitland Formation. Drilling records show this unit to contain sandstone, limestone, shale, carbonaceous shale, coal, and volcanic ash, representing the numerous environments of the coastal plain.

These above mentioned units are found along the broken area coming off the Archuleta anticlinorium. Also found in this area are Tertiary-aged intrusive dikes consisting of basalt (Wood, 1948). These dikes are aligned in a north-south orientation (fig. 2).

As one moves away from the broken ground and westward into the basin, materials become younger. The San Juan Basin has been subsiding through Tertiary time and has been filled with deposits consisting of sand, clay, gravel and volcanic ash. The Animas formation is a mass of highly varied continental sediments. The age of these materials is around 65 million years before present, on the boundary between the Cretaceous and Tertiary ages. The sedimentary materials are generally greenish in color and include andesitic debris. Very few fossils are found within this unit and the beds are generally discontinuous.

The youngest rocks found on the nation form the San Jose Formation. It consists mostly of banded variegated and red clays or siltstones and lenticular or sheetlike sandstones. This formation was deposited

Figure 2.—Geology map of the Jicarilla area, showing rock formations along the San Juan Basin and Southern Rocky Mountains with north to south intrusive dike alignment (New Mexico Geological Society, 1962).

along high energy, low-sinuosity streams and on extensive muddy floodplains that reflect the last preserved episode of sedimentation in the Laramide San Juan Basin of northwestern New Mexico (Smith, 1992). In the survey area, the formation often forms pink-colored, rounded ledge outcrops. The San Jose is early Eocene in age and contains the fossil remains of various mammals.

The Jicarilla Apache have purchased land once belonging to the Chama Land and Cattle Company. This property, covering over 32,000 acres, lies east of Chama on a structural feature known as the Brazos Slope (Muhlberger, 1960). The Chama Valley rises to the east and is topographically varied, with many resistant formations forming large domes, cuestas, and high cliffs. The mountain front rises 2,500 to 3,000 feet above the valley floor.

The oldest exposed geological formation consists of undifferentiated Jurassic rocks of the basal Chinle. It consists of siltstone to arkosic sandstone units. The Jurassic material is found only in localized areas near Chama.

A predominant unit in the Chama area is the Dakota formation. All of the major anticlines and domes form topographic highs because erosion has stripped the sediments down to the upper sandstone of the Dakota. Narrow canyons that cut into these structural features expose more of the upper Dakota sandstones. The Dakota consists of a cliff-forming lower sandstone member near Chama. The rock is pale orange, very fine to coarse grained and locally conglomeratic, and shows parallel and cross-bedding.

The Blanco Basin formation represents Tertiary rocks. It consists of arkosic conglomerate, sandstone, siltstones, and shale. In the Chama quadrangle, the Blanco Basin formation is separated from older rocks by a marked angular unconformity.

The Potosi volcanic series was formed during the Miocene Epoch (5 to 23 million years before present). It has been divided into six formations, of which only the lower two are present in the Chama quadrangle. The Conejos formation consists of quartz latite tuff, breccia, agglomerate, flow breccia, sandstone, conglomerate, and flows. It is overlain by the Treasure Mountain rhyolite. This formation contains volcanic sandstone, volcanic conglomerate, tuffaceous mudstone, and tuffaceous breccia. Lying above this material is a welded rhyolitic tuff that is light gray in color, grading into a pale red at the base. The welded tuff is of pyroclastic origin and is probably the result of a nuee ardente type of eruption. This is defined as a highly heated mass of gas-charged lava more or less horizontally ejected from a vent at the summit of a volcano. It then moves down-gradient as a swift flowing avalanche.

Oil and gas production is a very important component to the economy of northwestern New Mexico. Oil was first reported in 1882, and production began in 1922 in San Juan County. The San Juan Basin contributes about 7 percent of the state's production of oil. Approximately 47 percent of the state's natural gas production comes from the basin.

The northeastern portion of the basin has been relatively undeveloped, mostly because of the rough terrain, low productivity, and deeper reservoirs. Most of the production is generated from Fruitland coal and Pictured Cliffs reservoirs, with the deeper Mesaverde, Gallup, and Dakota formations producing natural gas (Hoppe, 1992).

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 of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil 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 soil 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.

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.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general map units in this survey have been grouped for broad interpretive purposes. The groupings are based on patterns of soil, potential native vegetation, climate, water resources, and land use which may be referred to as Major Land Resource Areas (Soil Survey Staff, 1981). Each of the broad groups and the map units in each group are described on the following pages.

Soil Descriptions

Nearly Level to Gently Sloping Soils on Stream Terraces; 10 to 12 Inches Mean Annual Precipitation

1. Elias-Councelor-Canyada

Setting

Landform: stream terraces
Elevation: 6,450 to 6,900 feet

Climatic Factors

Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation

Alkali sacaton, galleta, inland saltgrass, western wheatgrass, Indian ricegrass, blue grama, needleandthread, sand dropseed, fourwing saltbush, and black greasewood

Composition

Percent of survey area: 5
Elias soils: 25 percent
Councelor soils: 25 percent
Canyada soils: 25 percent
Minor soils: 25 percent

Minor Soils

Blancot soils on valley sides
Tsosie soils on valley sides
Sparank and Tapicito soils on stream terraces
Kwakina soils on flood plains
Riverwash in arroyos

Characteristics of the Elias Soil

Typical Profile

0 to 1 inch—very pale brown fine sandy loam
1 to 10 inches—grayish brown clay loam
10 to 36 inches—light yellowish brown very fine sandy loam and fine sandy loam
36 to 80 inches—light yellowish brown stratified fine sandy loam

Soil Properties and Qualities

Parent material: mixed alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow over moderately rapid
Available water capacity: high
Shrink-swell potential: moderate
Reaction: slightly to strongly alkaline
Sodicity: moderately sodic
Salinity: slightly to moderately saline
Surface runoff: slow

Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: slight

Characteristics of the Councelor Soil

Typical Profile

0 to 2 inches—pale brown fine sandy loam
2 to 32 inches—brown sandy loam and fine sandy loam
32 to 60 inches—brown loamy fine sand, sandy loam
60 to 80 inches—brown sandy clay loam

Soil Properties and Qualities

Parent material: alluvium and eolian materials derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: moderate
Shrink-swell potential: low
Reaction: slightly to moderately alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to very slightly saline
Surface runoff: slow
Hazard of flooding: none
Hazard of water erosion: slight
Hazard of soil blowing: moderately high

Characteristics of the Canyada Soil

Typical Profile

0 to 1 inch—brown silty clay
1 to 16 inches—brown clay
16 to 41 inches—pale brown fine sandy loam
41 to 80 inches—pale brown and very pale brown sand and fine sand

Soil Properties and Qualities

Parent material: stratified alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow over moderately rapid
Available water capacity: moderate
Shrink-swell potential: high
Reaction: slightly to strongly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Use and Management

Major Uses

Livestock grazing

Major Limitations

Elias soils: high sodicity
Councelor soils: slight salinity
Canyada soils: high shrink-swell potential

Interpretive Groups

Range Site:
Elias soils: salt flats, 037XA005NM
Counselor soils: sandy, 037XA002NM
Canyada soils: salt flats, 037XA005NM

Undulating to Rolling Soils on Plains; 10 to 12 Inches Mean Annual Precipitation

2. Doakum-Betonnie

Setting

Landform: plains, longitudinal dunes
Elevation: 6,600 to 7,000 feet

Climatic Factors

Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation

Blue grama, Indian ricegrass, galleta, big sagebrush, forbs

Composition

Percent of survey area: 9
Doakum soils: 55 percent
Betonnie soils: 25 percent
Contrasting Inclusions: 20 percent

Minor Soils

Oro soils on fans
Pinavetes and Florita soils on hills, valleys, and dunes

Characteristics of the Doakum Soil

Typical Profile

0 to 4 inches—brown fine sandy loam
4 to 12 inches—brown sandy clay loam
12 to 53 inches—brown very fine sandy loam, fine sandy loam, and sandy clay loam

53 to 80 inches—brown very fine sandy loam

Soil Properties and Qualities

Parent material: alluvium and eolian materials derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Characteristics of the Betonnie Soil

Typical Profile

0 to 4 inches—pale brown fine sandy loam
4 to 17 inches—brown fine sandy loam
17 to 50 inches—pale brown fine sandy loam
50 to 80 inches—light yellowish brown fine sandy loam and loamy fine sand

Soil Properties and Qualities

Parent material: eolian material from sandstone
Depth class: very deep
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: moderate
Shrink-swell potential: low
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: severe

Use and Management

Major Uses

Livestock grazing

Major Limitations

Betonnie soils: hazard of soil blowing

Interpretive Groups

Range Site:
Doakum soils: loamy, 037XA001NM
Betonnie soils: sandy, 037XA002NM

Undulating to Rolling Soils on Plains and Valleys; 12 to 16 Inches Mean Annual Precipitation

3. Lindrith-Royosa

Setting

Landform: plains and valleys
Slope:
Lindrith soils: 2 to 7 percent
Royosa soils: 2 to 7 percent
Elevation: 6,600 to 7,350 feet

Climatic Factors

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation

Pinyon pine, oneseed juniper, big sagebrush, blue grama, sand dropseed

Composition

Percent of survey area: 2
Lindrith soils: 50 percent
Royosa soils: 35 percent
Minor soils: 15 percent

Minor Soils

Parkelei soils on valley sides
Sparham soils on valley bottoms
Vessilla soils on summits

Characteristics of the Lindrith Soil

Typical Profile

0 to 7 inches—pale brown and brown loam
7 to 60 inches—brown and yellowish brown fine sandy loam
60 to 80 inches—pale brown fine sand

Soil Properties and Qualities

Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: moderate
Shrink-swell potential: low
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline

Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Royosa Soil

Typical Profile

0 to 2 inches—yellowish brown loamy fine sand
2 to 80 inches—light yellowish brown and yellowish brown loamy sand

Soil Properties and Qualities

Parent material: eolian material derived from sandstone
Depth class: very deep
Drainage class: somewhat excessively to excessively drained
Permeability: very rapid
Available water capacity: low
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: high

Use and Management

Major Uses

Livestock grazing and wildlife habitat

Major Limitations

Royosa soils: low available water capacity and hazard of soil blowing
Lindrith soils: hazard of water erosion

Interpretive Groups

Range Site:
Lindrith soils: loamy, 036XA006NM
Royosa soils: sandy, 036XA011NM

4. Orlie-Vosburg-Sparham

Setting

Landform: valleys
Position on landform:
Orlie soils: valley sides
Sparham soils: valley floors and stream terraces
Elevation: 6,900 to 7,400 feet

Climatic Factors

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation

Western wheatgrass, blue grama, Indian ricegrass, needleandthread, big sagebrush, and forbs

Composition

Percent of survey area: 16
Orlie soils: 40 percent
Vosburg soils: 20 percent
Sparham soils: 15 percent
Minor soils: 25 percent

Minor Soils

Millpaw, Hosta, and Cementlake soils on valley sides, floors, and swales
Hetz soils on valley floors
Gojiya soils on lake plains and drainageways
Teromote soils on stream terraces

Characteristics of the Orlie Soil

Typical Profile

0 to 2 inches—pale brown loam
2 to 22 inches—brown clay loam
22 to 80 inches—pale brown and brown silty clay loam and clay loam

Soil Properties and Qualities

Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Vosburg Soil

Typical Profile

0 to 3 inches—brown fine sandy loam
3 to 25 inches—brown sandy clay loam
25 to 35 inches—dark grayish brown sandy clay loam

35 to 80 inches—brown sandy clay loam

Soil Properties and Qualities

Parent material: alluvium derived from sandstone shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: slightly acid to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Characteristics of the Sparham Soil

Typical Profile

0 to 3 inches—brown clay
3 to 80 inches—dark brown and brown silty clay

Soil Properties and Qualities

Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: very slow
Available water capacity: high
Shrink-swell potential: high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: moderate

Use and Management

Major Uses

Livestock grazing and wildlife habitat

Major Limitations

Orlie soils: none
Sparham soils: very slow permeability, high shrink-swell potential, rare hazard of flooding

Interpretive Groups

Range Site:
Orlie and Vosburg soils: loamy, 036XA006NM
Sparham soils: clayey, 036XA002NM

Undulating to Hilly Soils on Hills, Mesas, and Ridges; 12 to 16 Inches Mean Annual Precipitation

5. Vessilla-Menefee-Orlie

Setting

Landform: Mesas, hillslopes, and valleys
Slope:
Vessilla soils: 1 to 30 percent
Menefee soils: 2 to 30 percent
Orlie soils: 1 to 8 percent
Elevation: 6,900 to 7,200 feet

Climatic Factors

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation

Pinyon pine, juniper, western wheatgrass, Indian ricegrass, blue grama, and big sagebrush

Composition

Percent of survey area: 3
Vessilla soils: 45 percent
Menefee soils: 25 percent
Orlie soils: 20 percent
Minor soils: 10 percent

Minor Soils

Rock outcrop on breaks and knolls
Royosa soils on backslopes
Sparham soils in drainageways

Characteristics of the Vessilla Soil

Typical Profile

0 to 1 inch—pale brown sandy loam
1 to 15 inches—pale brown and brown sandy loam
15 inches—sandstone bedrock

Soil Properties and Qualities

Parent material: slope alluvium, eolian material and residuum derived from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low

Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Menefee Soil

Typical Profile

0 to 3 inches—grayish brown clay loam
3 to 10 inches—grayish brown clay loam
10 inches—shale bedrock

Soil Properties and Qualities

Parent material: slope alluvium and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Orlie Soil

Typical Profile

0 to 4 inches—brown fine sandy loam
4 to 32 inches—brown clay loam
32 to 80 inches—brown sandy clay loam

Soil Properties and Qualities

Parent material: alluvium and eolian material derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to slighly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Use and Management

Major Uses

Wood products, livestock grazing and wildlife habitat

Major Limitations

Menefee and Vessilla soils: depth to bedrock, very low available water capacity, and hazard of water erosion
Orlie and Vessilla soils: hazard of soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups

Vessilla soils: pinyon juniper woodland
Menefee soils: pinyon juniper woodland
Orlie soils: loamy, 036XA006NM

6. Vessilla-Menefee-Rock Outcrop

Setting

Landform: hills, mesas
Position on landform:
Vessilla soils: breaks, escarpments, and ridges
Menefee soils: breaks, escarpments, and backslopes
Rock outcrop: escarpments and ridges
Slope:
Vessilla sandy loam: 15 to 45 percent
Menefee clay loam: 15 to 45 percent
Rock outcrop: 15 to 45 percent
Elevation: 6,900 to 7,200 feet

Climatic Factors

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation

Pinyon pine, oneseed juniper, western wheatgrass, blue grama, Indian ricegrass, and big sagebrush

Composition

Percent of survey area: 13
Vessilla soils: 25 percent
Menefee soils: 25 percent

Rock outcrop: 25 percent
Contrasting Inclusions: 25 percent

Minor Soils

Haplustalfs on north-aspect backslopes
Badland on escarpments
Rubbleland on escarpments

Characteristics of the Vessilla Soil

Typical Profile

0 to 3 inches—brown sandy loam
3 to 17 inches—dark yellowish brown and yellowish brown sandy loam
17 inches—sandstone bedrock

Soil Properties and Qualities

Parent material: slope alluvium, eolian, and residuum derived from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Menefee Soil

Typical Profile

0 to 3 inches—pale brown clay loam
3 to 9 inches—pinkish gray clay loam
9 inches—shale bedrock

Soil Properties and Qualities

Parent material: slope alluvium and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: none to very slightly saline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Rock outcrop

Rock outcrop consists of sandstone

Use and Management

Major Uses

Wildlife habitat

Major Limitations

Vessilla and Menefee soils: steep slopes, depth to bedrock, very low available water capacity, and hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups

Pinyon juniper woodland

7. Parkelei-Menefee-Vessilla

Setting

Landform: hills
Slope:
Parkelei soils: 2 to 10 percent
Menefee soils: 5 to 20 percent
Vessilla soils: 5 to 20 percent
Elevation: 6,700 to 7,800 feet

Climatic Factors

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation

Pinyon pine, oneseed juniper, big sagebrush, blue grama, western wheatgrass, and Indian ricegrass

Composition

Percent of survey area: 11
Parkelei soils: 45 percent
Menefee soils: 20 percent
Vessilla soils: 20 percent
Minor soils: 15 percent

Minor Soils

Lindrith soils on backslopes and valleys

Royosa soils on backslopes
Nalivag soils in narrow drainageways

Characteristics of the Parkelei Soil

Typical Profile

0 to 2 inches—light yellowish brown fine sandy loam
2 to 38 inches—light yellowish brown and yellowish brown sandy clay loam
38 to 80 inches—light yellowish brown sandy loam

Soil Properties and Qualities

Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Menefee Soil

Typical Profile

0 to 3 inches—pale brown clay loam
3 to 9 inches—pinkish gray clay loam
9 inches—shale bedrock

Soil Properties and Qualities

Parent material: slope alluvium and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: none to very slightly saline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Vessilla Soil

Typical Profile

0 to 3 inches—brown sandy loam
3 to 17 inches—dark yellowish brown and yellowish brown sandy loam
17 inches—sandstone bedrock

Soil Properties and Qualities

Parent material: alluvium, eolian, and residuum derived from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Use and Management

Major Uses

Wood products, posts and fuelwood, livestock grazing, and wildlife habitat

Major Limitations

Parkelei soils: hazard of water erosion
Menefee and Vessilla soils: depth to bedrock, very low available water holding capacity, hazard of water erosion
Vessilla soils: hazard of soil blowing

Interpretive Groups

Range Site:
Parkelei soils: loamy, 036XA006NM
Menefee soils: pinyon juniper woodland
Vessilla soils: pinyon juniper woodland

8. Menefee-Elpedro

Setting

Landform: hills and valleys
Position on landform: backslopes and valley sides
Slope:
Menefee soils: 2 to 35 percent
Elpedro soils: 1 to 5 percent
Elevation: 6,500 to 7,500 feet

Climatic Factors

Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation

Western wheatgrass, Indian ricegrass, blue grama, big sagebrush, pinyon, and juniper

Composition

Percent of survey area: 1
Menefee soils: 60 percent
Elpedro soils: 15 percent
Minor soils: 25 percent

Minor Soils

Peney and Ransect soils on limestone hills
Ruson soils on valleys
Menefee soils on summits

Characteristics of the Menefee Soil

Typical Profile

0 to 2 inches—light brownish gray channery loam
2 to 11 inches—light brownish gray clay loam
11 inches—shale

Soil Properties and Qualities

Parent material: slope alluvium, colluvium, and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Elpedro Soil

Typical Profile

0 to 3 inches—pale brown silt loam
3 to 80 inches—light yellowish brown silty clay loam

Soil Properties and Qualities

Parent material: alluvium and eolian materials derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses

Livestock grazing and wildlife habitat

Major Limitations

Menefee soils: available water capacity; water erosion hazard
Elpedro soils: none

Interpretive Groups

Menefee soils: pinyon juniper woodland
Range Site:
Elpedro soils: loamy, 036XA006NM

9. Wilmac-Hosta-Millpaw

Setting

Landform: hills and valleys
Slope:
Wilmac soils: 1 to 10 percent
Hosta soils: 1 to 8 percent
Millpaw soils: 1 to 4 percent
Elevation: 7,300 to 7,700 feet

Climatic Factors

Mean annual precipitation: 14 to 17 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 90 to 130 days

Native Vegetation

Western wheatgrass, blue grama, prairie junegrass, big sagebrush, and scattered Rocky Mountain juniper

Composition

Percent of survey area: 6
Wilmac soils: 45 percent
Hosta soils: 25 percent
Millpaw soils: 15 percent
Minor soils: 15 percent

Minor Soils

Menefee soils on ridges and summits
Cementlake soils in drainageways
Roques, Nusmag, Suposo, and Ohwiler soils in cooler narrow valleys

Characteristics of the Wilmac Soil

Typical Profile

0 to 3 inches—grayish brown loam
3 to 16 inches—brown clay loam
16 to 38 inches—light brownish gray clay loam
38 inches—fractured, partially weathered shale

Soil Properties and Qualities

Parent material: slope alluvium and residuum from shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low to moderate
Shrink-swell potential: high
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline to slightly saline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Hosta Soil

Typical Profile

0 to 2 inches—brown loam
2 to 27 inches—grayish brown clay loam
27 to 72 inches—brown or light brownish gray clay loam
72 to 80 inches—light brownish gray loam

Soil Properties and Qualities

Parent material: alluvium derived from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: very high
Shrink-swell potential: moderate to high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Millpaw Soil

Typical Profile

0 to 2 inches—brown loam
2 to 7 inches—brown sandy clay loam
7 to 49 inches—brown clay
49 to 80 inches—brown sandy clay

Soil Properties and Qualities

Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses

Livestock grazing and wildlife habitat

Major Limitations

Wilmac soils: depth to shale bedrock, slow permeability, high shrink-swell potential
Hosta and Millpaw soils: slow permeability, high shrink-swell potential

Interpretive Groups

Range Site:
Wilmac soils: mountain slopes, 048AY006NM
Hosta soils: mountain slopes, 048AY006NM
Millpaw soils: mountain loam, 048AY004NM

Gently Sloping to Moderately Steep Soils on Hills, Mesas, Cuestas, and Valleys; 16 to 20 Inches Mean Annual Precipitation

10. Escrito-Dulcepeak-Herm

Setting

Landform: cuestas, mesas, hillslopes and backslopes
Slope:
Escrito soils: 3 to 25 percent
Dulcepeak soils: 3 to 25 percent
Herm soils: 3 to 10 percent
Elevation: 7,200 to 8,800 feet

Climatic Factors

Mean annual precipitation: 16 to 20 inches

Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation

Ponderosa pine, Gambel's oak, Rocky Mountain juniper, antelope bitterbrush, Arizona fescue, bluegrass, elk sedge

Composition

Percent of survey area: 4
Escrito soils: 30 percent
Dulcepeak soils: 30 percent
Herm soils: 15 percent
Minor soils: 25 percent

Minor Soils

Haplustalfs on short canyon slopes
Rock outcrop on mesa rims and knolls

Characteristics of the Escrito Soil

Typical Profile

0 to 0.25 inches—slightly decomposed forest litter
0.25 to 6 inches—brown and yellowish brown very fine sandy loam
6 to 16 inches—light brown loam
16 inches—hard sandstone bedrock

Soil Properties and Qualities

Parent material: slope alluvium and residuum from sandstone and shale
Depth class: shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral to moderately acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: high

Characteristics of the Dulcepeak Soil

Typical Profile

0 to 5 inches—dark gray very cobbly loam
5 to 20 inches—brown and strong brown clay
20 to 26 inches—brown gravelly clay loam
26 inches—sandstone bedrock

Soil Properties and Qualities

Parent material: slope alluvium and residuum from sandstone and shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Characteristics of the Herm Soil

Typical Profile

0 to 4 inches—brown loam
4 to 11 inches—dark grayish brown silt loam
11 to 16 inches—yellowish brown clay
16 to 24 inches—light yellowish brown clay
24 to 80 inches—brownish yellow clay loam

Soil Properties and Qualities

Parent material: slope alluvium from sandstone and shale
Depth class: deep
Drainage class: well drained
Permeability: slow
Available water capacity: high to very high
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Use and Management

Major Uses

Commercial woodland, livestock grazing, and wildlife habitat

Major Limitations

Escrito soils: Depth to bedrock, available water capacity, and hazard of water erosion and soil blowing

Dulcepeak soils: depth to bedrock, slow permeability; high shrink-swell potential, and hazard of water erosion
Herm soils: slow permeability, high shrink-swell potential, hazard of water erosion

Interpretive Groups

Ponderosa pine woodland

11. Losindios-Escrito-Parkelei

Setting

Landform: hillslopes
Slope:
Losindios soils: 3 to 15 percent
Escrito soils: 3 to 25 percent
Parkelei soils: 3 to 15 percent
Elevation: 7,000 to 7,500 feet

Climatic Factors

Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 44 to 46 degrees F
Frost-free period: 90 to 110 days

Native Vegetation

Losindios soils: ponderosa pine, Gambel's oak, western wheatgrass, bluegrass, and big sagebrush
Escrito soils: Rocky Mountain juniper, pinyon pine, ponderosa pine, and Gambel's oak
Parkelei soils: pinyon pine, Rocky Mountain juniper, Gambel's oak, western wheatgrass, and blue grama

Composition

Percent of survey area: 8
Losindios soils: 35 percent
Escrito soils: 30 percent
Parkelei soils: 25 percent
Minor soils: 10 percent

Minor Soils

Ishkoten soils on north-facing backslopes
Millpaw soils in swales and drainageways
Teequee soils on benches and backslopes
Menefee soils on shoulders and backslopes
Rock outcrop on ridges, shoulders, and noseslopes

Characteristics of the Losindios Soil

Typical Profile

0 to 1 inch—slightly decomposed needle litter
1 to 2 inches—brown sandy loam
2 to 37 inches—brown and light yellowish brown sandy clay loam
37 to 80 inches—light yellowish brown sandy loam

Soil Properties and Qualities

Parent material: slope alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Escrito Soil

Typical Profile

0 to 4 inches—grayish brown sandy loam
4 to 16 inches—yellowish brown sandy loam
16 inches—hard sandstone bedrock

Soil Properties and Qualities

Parent material: slope alluvium and residuum from sandstone and shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Parkelei Soil

Typical Profile

0 to 2 inches—light yellowish brown fine sandy loam
2 to 38 inches—light yellowish brown and yellowish brown sandy clay loam
38 to 80 inches—light yellowish brown sandy loam

Soil Properties and Qualities

Parent material: alluvium derived from sandstone and shale

Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Use and Management

Major Uses

Losindios soils: livestock grazing, commercial woodland, and wildlife habitat
Escrito and Parkelei soils: livestock grazing, fuelwood, and wildlife habitat

Major Limitations

Losindios and Parkelei soils: hazard of water erosion and soil blowing
Escrito soils: depth to bedrock, available water capacity, hazard of water erosion and soil blowing

Interpretive Groups

Losindios soils: ponderosa pine woodland
Escrito soils: ponderosa pine woodland
Parkelei soils: pinyon juniper woodland

12. Ishkoten-Lajuita-Jaythree

Setting

Landform: mountain slopes, hillslopes
Slope:
Ishkoten soils: 5 to 60 percent
Lajuita soils: 5 to 35 percent
Jaythree soils: 3 to 15 percent
Elevation: 7,200 to 8,600 feet

Climatic Factors

Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation

Ponderosa pine, Gambel's oak, Rocky Mountain juniper, antelope bitterbrush, true mountainmahogany, Arizona fescue, blue grama, and bluegrass

Composition

Percent of survey area: 12
Ishkoten soils: 40 percent
Lajuita soils: 35 percent
Jaythree soils: 15 percent
Minor soils: 10 percent

Minor Soils

Rock outcrop on ridges, knolls, and backslopes
Losindios soils on toeslopes and valleys
Cedarsprings soils in valleys and drainageways
Ustorthents soils on short escarpments

Characteristics of the Ishkoten Soil

Typical Profile

0 to 1 inch—partially decomposed needles and leaf litter
1 to 6 inches—brown cobbly sandy loam
6 to 22 inches—brown cobbly sandy clay
22 to 34 inches—strong brown sandy clay loam
34 to 48 inches—partially weathered sandstone

Soil Properties and Qualities

Parent material: slope alluvium over residuum from interbedded sandstone and shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: high
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Lajuita Soil

Typical Profile

0 to 1 inch—pine needle litter
1 to 3 inches—dark gray cobbly sandy loam
3 to 11 inches—grayish brown sandy clay loam
11 to 15 inches—partially weathered sandstone

15 inches—hard sandstone

Soil Properties and Qualities

Parent material: slope alluvium over residuum from sandstone and shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderate
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Jaythree Soil

Typical Profile

0 to 0.5 inch—pine needle litter
0.5 to 2 inches—dark grayish brown sandy loam
2 to 24 inches—dark grayish brown sandy clay loam
24 to 80 inches—light yellowish brown sandy clay loam

Soil Properties and Qualities

Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Major Uses

Commercial woodland, livestock grazing, wildlife habitat

Major Limitations

Ishkoten and Lajuita soils: depth to bedrock, steep slopes, hazard of water erosion and soil blowing
Ishkoten soils: high shrink-swell potential
Jaythree soils: hazard of soil blowing

Interpretive Groups

Ponderosa pine woodland

Steep and Very Steep Soils on Mountains, Canyons, Cuesta Scarps and Hills; 16 to 20 Inches Mean Annual Precipitation

13. Haplustalfs-Ustorthents-Argiustolls

Setting

Landform: canyons, cuestas
Slope:
Haplustalfs soils: 25 to 75 percent
Ustorthents soils: 25 to 70 percent
Argiustolls soils: 25 to 55 percent
Elevation: 7,000 to 8,600 feet

Climatic Factors

Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation

Ponderosa pine, Douglas fir, Gambel's oak, Arizona fescue, bluegrass

Composition

Percent of survey area: 8
Haplustalfs soils: 40 percent
Ustorthents soils: 25 percent
Argiustolls soils: 15 percent
Minor soils: 20 percent

Minor Soils

Haplustepts soils on north aspects
Riparian bottoms
Rock outcrop on knolls, benches, and escarpments
Ishkoten soils on backslopes

Characteristics of the Haplustalfs Soil

Representative Profile

0 to 1 inch—partially decomposed needle litter
1 to 5 inches—grayish brown very stony sandy loam
5 to 60 inches—yellowish brown and light yellowish brown very stony sandy clay loam
60 to 80 inches—brown very stony sandy loam

Soil Properties and Qualities

Parent material: colluvium from sandstone and shale
Depth class: moderately deep to very deep
Drainage class: well drained
Permeability: moderate to moderately slow

Available water capacity: low to moderate
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Characteristics of the Ustorthents Soil

Representative Profile

0 to 3 inches—very bouldery brown sandy loam
3 to 8 inches—very stony light brownish gray loam
8 inches—soft shale bedrock

Soil Properties and Qualities

Parent material: residuum and colluvium from shale and sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderate
Available water capacity: low
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Characteristics of the Argiustolls Soil

Typical Profile

0 to 0.5 inch—partially decomposed needle litter
0.5 to 3 inches—very dark gray very stony loam
3 to 22 inches—dark grayish brown and light olive brown very stony clay loam
22 to 43 inches—light olive brown very stony sandy clay loam
43 to 80 inches—light yellowish brown very stony sandy loam

Soil Properties and Qualities

Parent material: slope alluvium and colluvium
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: low to moderate
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Use and Management

Major Uses

Wildlife habitat

Major Limitations

Steep slopes, stoniness, hazard of water erosion, landslide potential on south aspects, and slump or earthflow on north aspects following heavy winter snowfall

Interpretive Groups

Ponderosa pine and Douglas fir woodlands

Gently Sloping to Moderately Steep Soils on Cuestas, Mesas, and Structural Benches; 16 to 20 Inches Mean Annual Precipitation

14. Zau-Lomapedro

Setting

Landform: cuestas, mesas, structural benches
Slope:
Zau soils: 1 to 15 percent
Lomapedro soils: 1 to 8 percent
Elevation: 7,500 to 8,650 feet

Climatic Factors

Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation

Western wheatgrass, mountain muhly, needleandthread, sideoats grama, Indian ricegrass, Gambel's oak, and forbs

Composition

Percent of survey area: 1
Zau soils: 55 percent
Lomapedro soils: 35 percent
Minor soils: 10 percent

Minor Soils

Escrito soils on shoulders and ridges

Rock outcrop on shoulders and ridges
Zau soils on 15 to 35 percent slopes

Characteristics of the Zau Soil

Typical Profile

0 to 13 inches—dark grayish brown, grayish brown, and brown loam
13 to 16 inches—yellowish brown loam
16 to 21 inches—yellowish brown clay
21 to 48 inches—weathered sandstone

Soil Properties and Qualities

Parent material: alluvium and residuum derived from sandstone and shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Lomapedro Soil

Typical Profile

0 to 20 inches—dark grayish brown and very dark grayish brown loam
20 to 26 inches—brown clay loam
26 to 37 inches—light brown clay
37 to 52 inches—brownish yellow clay
52 inches—soft sandstone bedrock with interbedded shale

Soil Properties and Qualities

Parent material: allluvium over sandstone and shale residuum
Depth class: deep
Drainage class: well drained
Permeability: slow
Available water capacity: moderate
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Use and Management

Major Uses

Livestock grazing and wildlife habitat

Major Limitations

Zau soils: depth to bedrock
Zau and Lomapedro soils: hazard of water erosion

Interpretive Groups

Range Site:
mountain slopes, 048AY006M

15. Archmesa-Skyute

Setting

Landform: high mesas
Slope:
Archmesa soils: 1 to 20 percent
Skyute soils: 1 to 25 percent
Elevation: 8,200 to 8,600 feet

Climatic Factors

Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation

Ponderosa pine, Douglas fir, bluegrasses, Arizona fescue, and forbs

Composition

Percent of survey area: 1
Archmesa soils: 60 percent
Skyute soils: 25 percent
Minor soils: 15 percent

Minor Soils

Rock outcrop on knolls and low ridges
Ohwiler soils in swales

Characteristics of the Archmesa Soil

Typical Profile

0 to 10 inches—brown loam
10 to 35 inches—brown and yellowish brown clay loam
35 inches—hard sandstone bedrock

Soil Properties and Qualities

Parent material: slope alluvium and residuum from andesite
Depth class: moderately deep

Drainage class: well drained
Permeability: moderately slow
Available water capacity: low to moderate
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: rare
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Skyute Soil

Typical Profile

0 to 9 inches—brown loam
9 to 17 inches—yellowish brown and light yellowish brown clay loam
17 to 21 inches—hard andesite

Soil Properties and Qualities

Parent material: andesite residuum
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Use and Management

Major Uses

Livestock grazing, commercial woodland and wildlife habitat

Major Limitations

Archmesa and Skyute soils: depth to bedrock and hazard of water erosion
Skyute soils: available water capacity

Interpretive Groups

Ponderosa pine woodland

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey 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.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils 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, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties 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, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. 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 contrasting components are mentioned in the map unit descriptions. A few areas of minor components 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 minor components 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 landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. 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 and gives the principal hazards and limitations to be considered in planning for specific uses.

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, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most 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, Wilmac, dry, is a phase of the Wilmac series.

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

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. Jaythree-Cedarsprings complex, 3 to 15 percent slopes, 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. Orlie-Sparham association, 0 to 5 percent slopes, is an example.

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

Table 4 gives the acreage and proportionate extent of each map unit. Other 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.

Soil Descriptions

5—Water

Setting
Landform: valleys, drainageways
Elevation: 6,500 to 7,700 feet

Composition
Water: 85 percent (includes man-made reservoirs, natural lakes, and stock ponds)
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Shorelines

6—Miscellaneous Water

Setting
Landform: valleys
Elevation: 6,500 to 7,300 feet

Composition
Sewage lagoons: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Embankments

10—Elias-Canyada-Sparank complex, saline, sodic, 0 to 3 percent slopes

Setting
Landform: stream terraces (fig. 3)
Position on landform:
Elias soils: treads
Canyada soils: treads
Sparank soils: treads, swales
Elevation: 6,450 to 6,900 feet

Climatic Factors
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation
Alkali sacaton, galleta, western wheatgrass, Indian ricegrass, blue grama, fourwing saltbush, and black greasewood

Composition
Elias soils: 45 percent
Canyada soils: 30 percent
Sparank soils: 20 percent
Contrasting Inclusions: 5 percent

Contrasting Inclusions
Riverwash in arroyo bottoms

Characteristics of the Elias Soil

Typical Profile
0 to 1 inch—very pale brown fine sandy loam
1 inch to 10 inches—grayish brown clay loam
10 to 36 inches—light yellowish brown very fine sandy loam and fine sandy loam
36 to 80 inches—light yellowish brown stratified fine sandy loam

Soil Properties and Qualities
Parent material: mixed alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow over moderately rapid
Available water capacity: high
Shrink-swell potential: moderate
Reaction: slightly to strongly alkaline
Sodicity: moderately sodic
Salinity: slightly to moderately saline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: moderately high

Characteristics of the Canyada Soil

Typical Profile
0 to 1 inch—brown silty clay
1 inch to 16 inches—brown clay
16 to 41 inches—pale brown fine sandy loam
41 to 80 inches—pale brown and very pale brown sand and fine sand

Figure 3.—Typical area of map unit 10, Elias-Canyada-Sparank complex, saline, sodic, 0 to 3 percent slopes.

Soil Properties and Qualities
Parent material: stratified alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow over moderately rapid
Available water capacity: moderate
Shrink-swell potential: high
Reaction: slightly alkaline to strongly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Characteristics of the Sparank Soil

Typical Profile
0 to 3 inches—brown silty clay loam
3 to 14 inches—brown silty clay
14 to 44 inches—pale brown and light brownish gray silty clay loam
44 to 60 inches—pale brown silty clay
60 to 80 inches—pale brown sandy clay loam

Soil Properties and Qualities
Parent material: clayey alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: very slow
Available water capacity: high
Shrink-swell potential: moderate to high
Reaction: moderately to strongly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to slightly saline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing

Major Limitations
Sparank and Canyada soils: high shrink-swell potential
Elias soils: high sodicity, hazard of soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Elias soils: salt flats, 037XA005NM
Canyada soils: salt flats, 037XA005NM
Sparank soils: salt flats, 037XA005NM

13—Doakum-Betonnie fine sandy loams, 0 to 8 percent slopes

Setting
Landform: plains, longitudinal dunes (fig. 4)
Position on landform:
Doakum soils: swales, interdunes, summits
Betonnie soils: knolls, backslopes
Slope:
Doakum soils: 0 to 3 percent
Betonnie soils: 3 to 8 percent
Elevation: 6,600 to 7,000 feet

Climatic Factors
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation
Blue grama, galleta, Indian ricegrass, big sagebrush, and forbs

Composition
Doakum soils: 45 percent
Betonnie soils: 45 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Pinavetes soils on longitudinal dune summits
Skyvillage soils on ridges, backslopes, and breaks

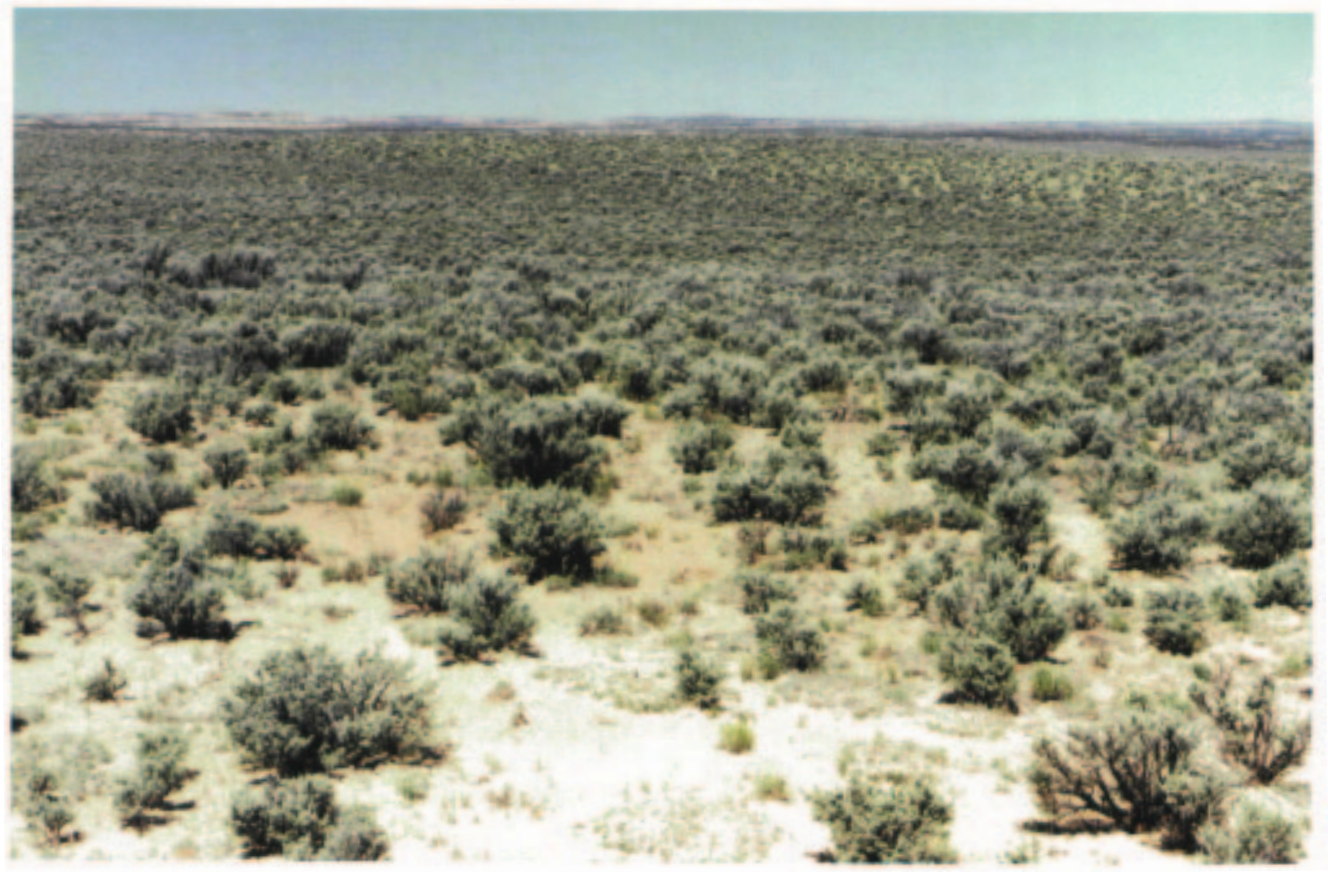

Figure 4.—Typical area of map unit 13, Doakum-Betonnie fine sandy loam, 0 to 8 percent slopes.

Characteristics of the Doakum Soil

Typical Profile
0 to 4 inches—brown fine sandy loam
4 to 12 inches—brown sandy clay loam
12 to 53 inches—brown very fine sandy loam, fine sandy loam, and sandy clay loam
53 to 80 inches—brown very fine sandy loam

Soil Properties and Qualities
Parent material: alluvium and eolian materials derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Characteristics of the Betonnie Soil

Typical Profile
0 to 4 inches—pale brown fine sandy loam
4 to 17 inches—brown fine sandy loam
17 to 50 inches—pale brown fine sandy loam
50 to 80 inches—light yellowish brown fine sandy loam and loamy fine sand

Soil Properties and Qualities
Parent material: eolian material from sandstone
Depth class: very deep
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: moderate
Shrink-swell potential: low
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: severe

Use and Management

Major Uses
Livestock grazing

Major Limitations
Betonnie soils: hazard of soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Doakum soils: loamy, 037XA001NM
Betonnie soils: sandy, 037XA002NM

18—Sparham clay, 0 to 3 percent slopes

Setting
Landform: stream terraces
Position on landform: treads
Elevation: 6,900 to 7,400 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, alkali sacaton, and bottlebrush squirreltail

Composition
Sparham soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Menefee soils on shale ridges
Vessilla soils on sandstone ridges
Riverwash in arroyos

Characteristics of the Sparham Soil

Typical Profile
0 to 2 inches—brown clay
2 to 80 inches—brown silty clay

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: very slow
Available water capacity: very high
Shrink-swell potential: high
Reaction: slightly alkaline
Sodicity: nonsodic to slightly sodic

Salinity: nonsaline to slightly saline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing

Major Limitations
Very slow permeability

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
clayey, 036XA002NM

19—Sparham silt loam, 0 to 3 percent slopes

Setting
Landform: stream terraces
Position on landform: treads
Elevation: 7,100 to 7,500 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, alkali sacaton, and bottlebrush squirreltail

Composition
Sparham soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Teromote soils on valley sides
Royosa soils below sandstone escarpments

Characteristics of the Sparham silt loam

Typical Profile
0 to 9 inches—light brownish gray silt loam
9 to 80 inches—grayish brown and light brownish gray silty clay

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: very slow
Available water capacity: very high
Shrink-swell potential: high
Reaction: slightly alkaline
Sodicity: slightly sodic
Salinity: very slightly saline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Very slow permeability

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
clayey, 036XA002NM

20—Menefee-Vessilla-Rock outcrop complex, 5 to 35 percent slopes

Setting
Landform: mesas and hills (fig. 5)
Position on landform:
Menefee soils: backslopes, summits, breaks
Vessilla soils: backslopes, summits, benches, ridges
Rock outcrop: escarpments, shoulders, ridges
Slope:
Menefee soils: 5 to 35 percent
Vessilla soils: 5 to 25 percent
Elevation: 6,900 to 7,600 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Pinyon pine, oneseed juniper, western wheatgrass, blue grama, Indian ricegrass, and big sagebrush

Composition
Menefee soils: 35 percent
Vessilla soils: 30 percent
Rock outcrop: 20 percent

Contrasting Inclusions: 15 percent

Contrasting Inclusions
Lindrith soils on toeslopes sides
Orlie soils in narrow drainageways
Nalivag soils on toeslopes

Characteristics of the Menefee Soil

Typical Profile
0 to 3 inches—pale brown clay loam
3 to 9 inches—pinkish gray clay loam
9 inches—shale

Soil Properties and Qualities
Parent material: slope alluvium and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline to very slightly saline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Vessilla Soil

Typical Profile
0 to 1 inch—light yellowish brown sandy loam
1 inch to 9 inches—brown sandy loam
9 inches—sandstone bedrock

Soil Properties and Qualities
Parent material: slope alluvium, eolian, and residual material derived from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic

Figure 5.—Typical area of map unit 20, Menefee-Vesilla-Rock outcrop complex, 5 to 35 percent slopes.

Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of Rock outcrop

Typically, there is a sandstone escarpment with shale outcropping below the escarpment.

Use and Management

Major uses
Wood products and wildlife habitat

Major Limitations
Depth to bedrock, hazard of water erosion and soil blowing, very low available water capacity

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Pinyon juniper woodland

21—Badland-Menefee-Rock outcrop complex, 35 to 65 percent slopes

Setting
Landform: mesas and hills
Position on landform:
Badland: escarpments
Menefee soils: mesas
Rock outcrop: escarpments
Slope:
Badland: 35 to 65 percent
Menefee soils: 35 to 45 percent
Elevation: 6,600 to 7,700 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Badland: devoid of vegetation
Menefee soils: pinyon pine, oneseed juniper, blue grama, western wheatgrass, and Indian ricegrass

Composition
Badland: 35 percent
Menefee soils: 35 percent
Rock outcrop: 20 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Vessilla soils on benches and ridges

Characteristics of the Badland

Representative Profile
Less than 3 inches of clayey material over weakly consolidated shale. Textures range from clay loam to clay.

Characteristics of the Menefee Soil

Typical Profile
0 to 2 inches—pale brown clay loam
2 to 8 inches—reddish brown clay loam
8 inches—soft shale

Soil Properties and Qualities
Parent material: slope alluvium and residuum from sandstone and shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic to very slightly sodic
Salinity: nonsaline to very slightly saline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of Rock outcrop

Typically, there is a sandstone escarpment with shale outcropping below the escarpment.

Use and Management

Major Uses
Wildlife habitat

Major Limitations
Menefee soils: depth to bedrock, steep slopes, hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Pinyon juniper woodland

23—Teromote silty clay loam, 1 to 3 percent slopes

Setting
Landform: valleys
Position on landform: valley sides

Elevation: 7,100 to 7,300 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, alkali sacaton, and big sagebrush

Composition
Teromote soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Sparham soils on valley floors
Lindrith soils on valley sides

Characteristics of the Teromote Soil

Typical Profile
0 to 19 inches—brown silty clay loam
19 to 40 inches—brown and dark yellowish brown stratified fine sandy loam and silty clay loam
40 to 80 inches—yellowish brown clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: none
Hazard of water erosion: slight
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Hazard of flooding

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
swale, 036XA017NM

24—Orlie-Sparham association, 0 to 5 percent slopes

Setting
Landform: valleys, stream terraces
Position on landform:
Orlie: valley sides
Sparham: valley floors and terrace treads
Slope:
Orlie: 1 to 5 percent
Sparham: 0 to 3 percent
Elevation: 7,000 to 7,500 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, galleta,blue grama, Indian ricegrass, alkali sacaton, and big sagebrush

Composition
Orlie soils: 45 percent
Sparham soils: 35 percent
Contrasting Inclusions: 20 percent

Contrasting Inclusions
Oro soils on valley floors
Cementlake soils on valley floors and stream terraces
Riverwash in arroyos

Characteristics of the Orlie Soil

Typical Profile
0 to 2 inches—yellowish brown fine sandy loam
2 to 25 inches—brown clay loam
25 to 80 inches—light yellowish brown sandy clay loam and clay loam

Soil Properties and Qualities
Parent material: alluvium and eolian materials derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: none

Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Characteristics of the Sparham Soil

Typical Profile
0 to 3 inches—brown clay
3 to 80 inches—dark brown and brown silty clay

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: very slow
Available water capacity: high
Shrink-swell potential: high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Orlie soils: none
Sparham soils: very slow permeability, high shrink-swell potential, rare hazard of flooding

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Orlie soils: loamy, 036XA006NM
Sparham soils: clayey, 036XA002NM

32—Doakum very fine sandy loam, 1 to 6 percent slopes

Setting
Landform: plains
Position on landform: gently sloping summits and uplands (fig. 6)
Elevation: 6,500 to 7,100 feet

Climatic Factors
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation
Big sagebrush, blue grama, galleta, and Indian ricegrass

Composition
Doakum soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Betonnie soils on relic dunes and hillslopes
Oro soils in swales

Characteristics of the Doakum Soil

Typical Profile
0 to 4 inches—-light brown very fine sandy loam
4 to 12 inches—brown sandy clay loam
12 to 53 inches—brown very fine sandy loam, fine sandy loam, and sandy clay loam
53 to 80 inches—brown very fine sandy loam

Soil Properties and Qualities
Parent material: alluvium and eolian materials derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Livestock grazing

Major Limitations
None

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Figure 6.—Typical area of map unit 32, Doakum very fine sandy loam, 1 to 6 percent slopes.

Interpretive Groups
Range Site:
loamy, 037XA001NM

40—Parkelei-Menefee-Vessilla complex, 2 to 20 percent slopes

Setting
Landform: hills
Position on landform:
Parkelei soils: backslopes and toeslopes
Menefee soils: shoulders and backslopes
Vessilla soils: ridges and backslopes
Slope:
Parkelei soils: 2 to 10 percent
Menefee soils: 5 to 20 percent
Vessilla soils: 5 to 20 percent
Elevation: 6,700 to 7,800 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Pinyon pine, oneseed juniper, big sagebrush, blue grama, Indian ricegrass, and western wheatgrass

Composition
Parkelei soils: 45 percent
Menefee soils: 20 percent
Vessilla soils: 20 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Lindrith soils on backslopes and valleys
Royosa soils on backslopes
Nalivag soils in narrow drainageways

Characteristics of the Parkelei Soil

Typical Profile
0 to 2 inches—light yellowish brown fine sandy loam
2 to 38 inches—light yellowish brown and yellowish brown sandy clay loam

38 to 80 inches—light yellowish brown sandy loam

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Menefee Soil

Typical Profile
0 to 3 inches—pale brown clay loam
3 to 9 inches—pinkish gray clay loam
9 inches—fractured shale

Soil Properties and Qualities
Parent material: slope alluvium and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to very slightly saline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Vessilla Soil

Typical Profile
0 to 3 inches—brown sandy loam
3 to 17 inches—dark yellowish brown and yellowish brown sandy loam
17 inches—sandstone bedrock

Soil Properties and Qualities
Parent material: alluvium, eolian material, and residuum derived from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Wood products, posts and fuelwood, livestock grazing, and wildlife habitat

Major Limitations
Parkelei soils: hazard of water erosion
Menefee and Vessilla soils: depth to bedrock, very low available water holding capacity, hazard of water erosion
Vessilla soils: hazard of soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Parkelei soils: loamy, 036XA006NM
Menefee soils: pinyon juniper woodland
Vessilla soils: pinyon juniper woodland

64—Dula loam, 0 to 2 percent slopes

Setting
Landform: flood plains (fig. 7)
Position on landform: treads
Elevation: 6,450 to 6,900 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Tufted hairgrass, sedges, Kentucky bluegrass, western wheatgrass, needlegrass, and rushes

Composition
Dula soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Wet spots on stream terraces

Typical Profile of Dula loam
0 to 11 inches—dark grayish brown and brown loam

Figure 7.—Typical area of map unit 64, Dula loam, 0 to 2 percent slopes. Map unit 553, Haplustalfs-Ustorthents complex, 25 to 70 percent slopes, is in the background.

11 inch to 28 inches—grayish brown loam
28 to 80 inches—multicolored extremely gravelly coarse sand

Soil Properties and Qualities
Parent material: alluvium derived from mixed sources
Depth class: very deep
Drainage class: poorly drained
Permeability: moderate over very rapid
Available water capacity: low to moderate
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: frequent
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Coarse fragments in subsoil, hazard of flooding, high water table

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
mountain meadows, 048AY005NM

69—Pinavetes-Florita complex, 2 to 10 percent slopes

Setting
Landform: low hills, valleys, and dunes
Position on landform:
Pinavetes soils: dunes, and fans
Florita soils: toeslopes, valley sides
Slope:
Pinavetes soils: 2 to 10 percent
Florita soils: 2 to 6 percent
Elevation: 6,450 to 6,900 feet

Climatic Factors
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation
Indian ricegrass, sand dropseed, big sagebrush, blue grama, and galleta

Composition
Pinavetes soils: 50 percent
Florita soils: 40 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Sparank soils on stream terraces

Characteristics of the Pinavetes Soil

Typical Profile
0 to 2 inches—pale brown loamy sand
2 to 80 inches—brown, pale brown and light yellowish brown loamy sand and sand

Soil Properties and Qualities
Parent material: eolian and alluvial material derived from sandstone
Depth class: very deep
Drainage class: excessively
Permeability: rapid
Available water capacity: low
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: high

Characteristics of the Florita Soil

Typical Profile
0 to 31 inches—pale brown fine sandy loam
31 to 41 inches—light yellowish brown sandy loam
41 to 80 inches—pale brown fine sandy loam

Soil Properties and Qualities
Parent material: alluvium and eolian material derived from sandstone
Depth class: very deep
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: moderate
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Pinavetes and Florita soils: hazard of soil blowing
Pinavetes soils: low available water holding capacity

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Pinavetes soils: sandy, 037XA002NM
Florita soils: loamy, 037XA001NM

70—Blancot-Councelor-Tsosie complex, 0 to 5 percent slopes

Setting
Landform: alluvial fans, valleys, and drainageways (fig. 8)
Position on landform:
Blancot soils: valley sides
Councelor soils: upper fans and valley sides, and drainage bottoms

Tsosie soils: lower fans and valley sides, and drainage bottoms
Slope:
Blancot soils: 1 to 5 percent
Councelor soils: 1 to 5 percent
Tsosie soils: 0 to 3 percent
Elevation: 6,600 to 7,000 feet

Climatic Factors
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation
Indian ricegrass, galleta, blue grama, fourwing saltbush, and black greasewood

Composition
Blancot soils: 30 percent
Councelor soils: 30 percent
Tsosie soils: 30 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Elias soils on toeslopes and drainageways
Oro soils on alluvial flats

Characteristics of the Blancot Soil

Typical Profile
0 to 7 inches—brown loam
7 to 26 inches—grayish brown clay loam
26 to 80 inches—brown clay loam

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to very slightly saline

Figure 8.—Typical area of map unit 70, Blancot-Councelor-Tsosie complex, 0 to 5 percent slopes. Map unit 105, Badland-Menefee complex, 15 to 35 percent slopes, is in the background.

Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Characteristics of the Councelor Soil

Typical Profile
0 to 2 inches—pale brown fine sandy loam
2 to 32 inches—brown sandy loam and fine sandy loam
32 to 60 inches—brown loamy fine sand, sandy loam
60 to 80 inches—brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium and eolian materials derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: moderate
Shrink-swell potential: low
Reaction: slightly to moderately alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to very slightly saline
Surface runoff: slow
Hazard of flooding: none
Hazard of water erosion: slight
Hazard of soil blowing: moderately high

Characteristics of the Tsosie Soil

Typical Profile
0 to 2 inches—pale brown clay loam
2 to 36 inches—brown, yellowish brown and pale brown loam, clay loam, and sandy clay loam
36 to 80 inches—yellowish brown and pale brown stratified sandy loam

Soil Properties and Qualities
Parent material: alluvium derived from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: moderate
Shrink-swell potential: moderate
Reaction: slightly to moderately alkaline
Sodicity: slightly to moderately sodic
Salinity: nonsaline to slightly saline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: slight
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Slightly saline and sodic

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Blancot soils: loamy, 037XA001NM
Counselor soils: sandy, 037XA002NM
Tsosie soils: salty bottomland, 037XA005NM

104—Doakum-Oro complex, 0 to 5 percent slopes

Setting
Landform: fans and stream terraces (fig. 9)
Position on landform:
Doakum soils: fan summits and terrace treads
Oro soils: fan summits and terrace treads
Slope:
Doakum soils: 1 to 5 percent
Oro soils: 0 to 3 percent
Elevation: 6,500 to 7,200 feet

Climatic Factors
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation
Big sagebrush, Indian ricegrass, blue grama, galleta, and alkali sacaton

Composition
Doakum soils: 60 percent
Oro soils: 25 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Councelor soils on ridges
Elias soils in swales and toeslopes

Characteristics of the Doakum Soil

Typical Profile
0 to 3 inches—brown fine sandy loam
3 to 33 inches—dark yellowish brown, yellowish brown, brown sandy clay loam

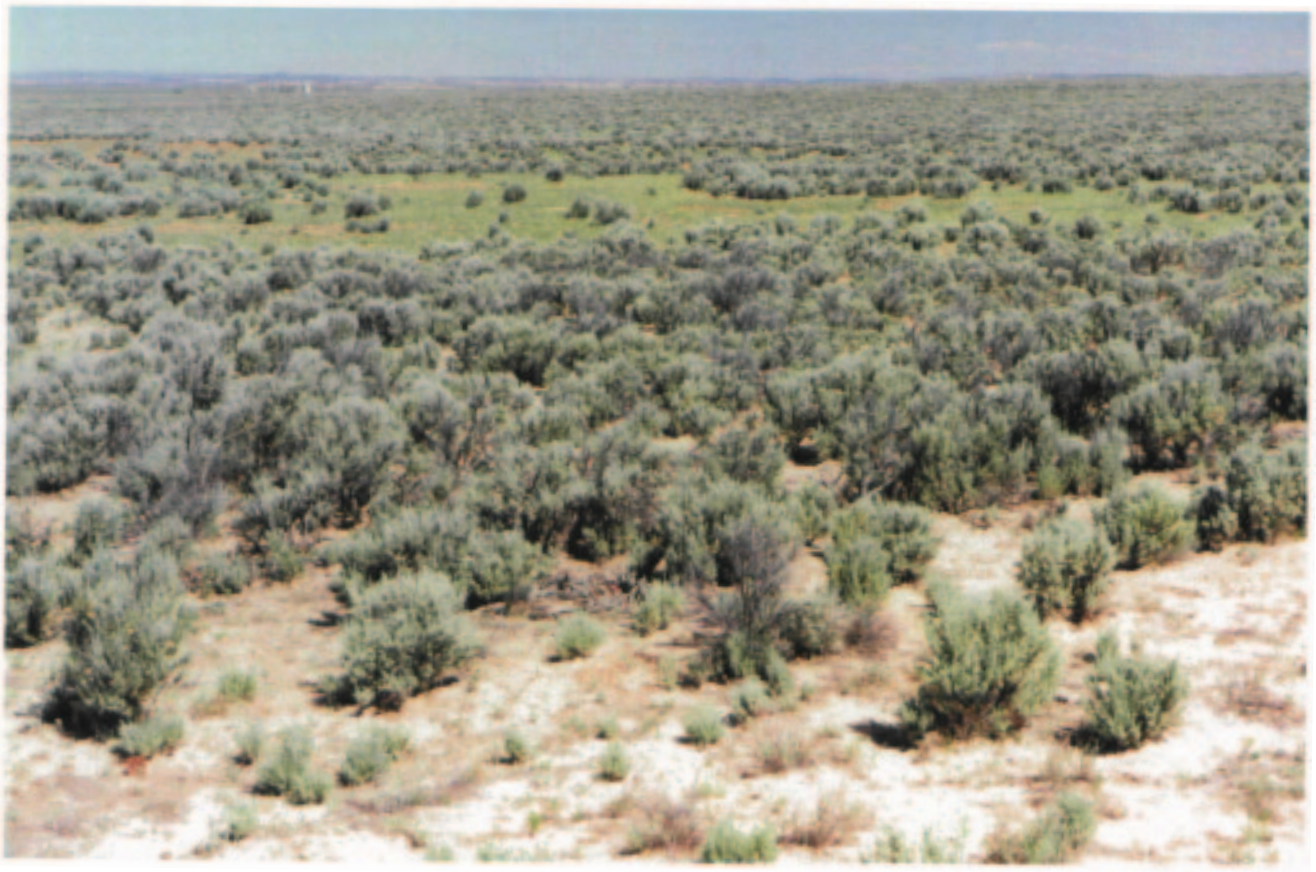

Figure 9.—Typical area of map unit 104, Doakum-Oro complex, 0 to 5 percent slopes.

33 to 55 inches—pale brown sandy clay loam and fine sandy loam
55 to 80 inches—light yellowish brown fine sandy loam

Soil Properties and Qualities

Parent material: eolian and alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: slight
Hazard of soil blowing: moderately high

Characteristics of the Oro Soil

Typical Profile

0 to 2 inches—brown clay loam
2 to 25 inches—brown and light brown clay
25 to 39 inches—brown and pale brown fine sandy loam
39 to 80 inches— brown loamy fine sand

Soil Properties and Qualities

Parent material: alluvium derived from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: slow over moderately rapid
Available water capacity: moderate
Shrink-swell potential: high in the upper part, low in the lower part
Reaction: slightly to moderately alkaline

Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: high
Hazard of flooding: none
Hazard of water erosion: slight
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing

Major Limitations
Oro soils: slow permeability, high shrink-swell potential

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Doakum soils: loamy, 037XA001NM
Oro soils: clayey, 037XA004NM

105—Badland-Menefee complex, 15 to 35 percent slopes

Setting
Landform: cuestas, hillslopes
Position on landform: escarpments
Slope:
Badland: 15 to 35 percent
Menefee: 15 to 35 percent
Elevation: 6,500 to 7,600 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Badland: nonvegetated
Menefee soils: juniper and pinyon pine, galleta, and blue grama

Composition
Badland: 50 percent
Menefee soils: 30 percent
Contrasting Inclusions: 20 percent

Contrasting Inclusions
Parkelei soils on toeslopes
Sparham soils on valley floors
Vessilla soils on ridges

Characteristics of the Badland

Representative Profile
Less than 3 inches of clayey material over weakly consolidated shale. Textures range from clay loam to clay.

Characteristics of the Menefee Soil

Typical Profile
0 to 4 inches—olive brown loam
4 to 10 inches—olive clay loam
10 inches—shale

Soil Properties and Qualities
Parent material: shale residuum and slope alluvium
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline to slight
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Use and Management

Major Uses
Wood products, posts and fuelwood, livestock grazing, and wildlife habitat.

Major Limitations
Menefee soil: very low available water capacity, depth to bedrock, and hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Menefee soils: pinyon juniper woodland

107—Berryman-Ruson association, 1 to 8 percent slopes

Setting
Landform: valleys
Position on landform:
Berryman soils: valley side alluvium

Ruson soils: valley floors
Slope:
Berryman soils: 3 to 8 percent
Ruson soils: 1 to 3 percent
Elevation: 7,200 to 7,500 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, alkali sacaton, bottlebrush squirreltail, galleta, blue grama, and big sagebrush

Composition
Berryman soils: 55 percent
Ruson soils: 30 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Menefee soils on summits

Characteristics of the Berryman Soil

Typical Profile
0 to 3 inches—light brownish gray silt loam
3 to 80 inches—light brownish gray silty clay loam

Soil Properties and Qualities
Parent material: alluvium derived from limestone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: moderate
Reaction: moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Ruson Soil

Typical Profile
0 to 2 inches—light brownish gray silt loam
2 to 19 inches—light brownish gray silty clay loam
19 to 80 inches—grayish brown clay

Soil Properties and Qualities
Parent material: alluvium derived from shale
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: high
Reaction: moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Slow permeability and hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Berryman soils: clayey, 036XA002NM
Ruson soils: swale, 036XA017NM

108—Peney-Ransect association, 1 to 20 percent slopes

Setting
Landform: hills
Position on landform:
Peney soils: summits
Ransect soils: backslopes and summits
Slope:
Peney soils: 3 to 20 percent
Ransect soils: 1 to 6 percent
Elevation: 7,100 to 7,800 feet

Climatic Factors
Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Pinyon pine, Rocky Mountain juniper, Gambel's oak, mountainmahogany, prairie junegrass, and Indian ricegrass; small areas of ponderosa pine

Composition
Peney soils: 50 percent
Ransect soils: 35 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Ruson soils on valley bottoms
Berryman soils on valley sides
Rock outcrop

Characteristics of the Peney Soil

Typical Profile
0 to 3 inches—brown channery loam
3 to 10 inches—grayish brown and very pale brown silt loam
10 inches—limestone

Soil Properties and Qualities
Parent material: alluvium and colluvium derived from limestone
Depth class: shallow
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Ransect Soil

Typical Profile
0 to 3 inches—light yellowish brown silty clay loam
3 to 38 inches—brown and light yellowish brown clay loam
38 inches—limestone

Soil Properties and Qualities
Parent material: alluvium derived from limestone
Depth class: moderately deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: moderate
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Use and Management

Major Uses
Wood products, fuelwood, fence posts, and wildlife habitat

Major Limitations
Peney soils: hazard of water erosion and soil depth
Ransect soils: hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Pinyon juniper woodland

115—Menefee channery loam, 2 to 35 percent slopes

Setting
Landform: hills
Position on landform: hillslopes
Elevation: 7,000 to 7,500 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Pinyon pine, oneseed juniper, big sagebrush, and blue grama

Composition
Menefee soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Berryman soils on valley sides
Elpedro soils on valley sides

Characteristics of the Menefee Soil

Typical Profile
0 to 2 inches—light brownish gray channery loam
2 to 11 inches—light brownish gray clay loam
11 inches—shale

Soil Properties and Qualities
Parent material: slope alluvium, colluvium, and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe

Hazard of soil blowing: moderate

Use and Management

Major Uses
Wood products, fuelwood, fenceposts, and wildlife habitat

Major Limitations
Hazard of water erosion and depth to bedrock

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Menefee soils: Pinyon-juniper woodland

119—Roques-Nusmag clay loams, 1 to 8 percent slopes

Setting
Landform: valleys, stream terraces
Position on landform:
Roques soils: valley sides
Nusmag soils: terrace treads
Slope:
Roques soils: 1 to 8 percent
Nusmag soils: 1 to 3 percent
Elevation: 7,300 to 8,000 feet

Climatic Factors
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Western wheatgrass, prairie junegrass, spike muhly, and sedges

Composition
Roques soils: 45 percent
Nusmag soils: 35 percent
Contrasting Inclusions: 20 percent

Contrasting Inclusions
Horselake soils on hillslopes
Menefee soils on summits
Tottles soils on stream terraces and valley bottoms

Characteristics of the Roques Soil

Typical Profile
0 to 2 inches—light olive brown clay loam
2 to 80 inches—light olive brown clay

Soil Properties and Qualities
Parent material: alluvium derived from shale
Depth class: very deep
Drainage class: well drained
Permeability: very slow
Available water capacity: high
Shrink-swell potential: high
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline to slightly saline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Characteristics of the Nusmag Soil

Typical Profile
0 to 2 inches—dark grayish brown clay loam
2 to 18 inches—dark grayish brown clay
18 to 80 inches—grayish brown clay

Soil Properties and Qualities
Parent material: alluvium derived from shale
Depth class: very deep
Drainage class: moderately well drained
Permeability: very slow
Available water capacity: high
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline to slightly saline
Surface runoff: medium
Depth to water table: 42 to 60 inches, March to June
Hazard of flooding: rare
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing

Major Limitations
Roques and Nusmag soils: very slow permeability
Nusmag soils: hazard of flooding and high water table

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Roques soils: mountain valley, 048AY007NM
Nusmag soils: mountain meadows, 048AY005NM

136—Elpedro silt loam, 1 to 5 percent slopes

Setting
Landform: hills and valleys
Position on landform: backslopes and valley sides
Elevation: 6,500 to 7,400 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, Indian ricegrass, blue grama, big sagebrush, scattered pinyon and juniper

Composition
Elpedro soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Ruson soils on valley floors
Menefee soils on summits

Characteristics of the Elpedro Soil

Typical Profile
0 to 3 inches—pale brown silt loam
3 to 80 inches—light yellowish brown silty clay loam

Soil Properties and Qualities
Parent material: alluvium and eolian materials derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
None

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
loamy, 036XA006NM

155—Vessilla-Menefee-Orlie complex, 1 to 30 percent slopes

Setting
Landform: Mesas and hillslopes
Position on landform:
Vessilla soils: breaks, ridges, and backslopes
Menefee soils: backslopes
Orlie soils: summits, backslopes, and toeslopes
Slope:
Vessilla soils: 1 to 30 percent
Menefee soils: 2 to 30 percent
Orlie soils: 1 to 8 percent
Elevation: 6,900 to 7,200 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Pinyon pine, juniper, big sagebrush, western wheatgrass, and blue grama

Composition
Vessilla soils: 45 percent
Menefee soils: 25 percent
Orlie soils: 20 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Rock outcrop on breaks and knolls
Pinavetes soils on backslopes
Sparham soils in drainageways

Characteristics of the Vessilla Soil

Typical Profile
0 to 1 inch—pale brown sandy loam
1 inch to 15 inches—pale brown and brown sandy loam
15 inches—sandstone bedrock

Soil Properties and Qualities
Parent material: slope alluvium, eolian material, and residuum derived from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral to slightly alkaline
Sodicity: nonsodic

Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Menefee Soil

Typical Profile
0 to 3 inches—grayish brown clay loam
3 to 10 inches—grayish brown clay loam
10 inches—shale bedrock

Soil Properties and Qualities
Parent material: slope alluvium and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Orlie Soil

Typical Profile
0 to 4 inches—brown fine sandy loam
4 to 32 inches—brown clay loam
32 to 80 inches—brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium and eolian material derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Wood products, livestock grazing and wildlife habitat

Major Limitations
Menefee and Vessilla soils: depth to bedrock, very low available water capacity, and hazard of water erosion
Orlie and Vessilla soils: hazard of soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Orlie soils: loamy, 036XA006NM
Vessilla soils: pinyon juniper woodland
Menefee soils: pinyon juniper woodland

156—Lindrith-Royosa complex, 2 to 7 percent slopes

Setting
Landform: plains and valleys (fig. 10)
Position on landform:
Lindrith soils: valley side alluvium
Royosa soils: dunes
Slope:
Lindrith and Royosa soils: 2 to 7 percent
Elevation: 6,600 to 7,350 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Pinyon pine, oneseed juniper, big sagebrush, blue grama, and sand dropseed

Composition
Lindrith soils: 50 percent
Royosa soils: 35 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Parkelei soils on valley sides
Sparham soils on valley bottoms
Vessilla soils on summits

Characteristics of the Lindrith Soil

Typical Profile
0 to 7 inches—pale brown and brown loam
7 to 60 inches—brown and yellowish brown fine sandy loam
60 to 80 inches—pale brown fine sand

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale

Depth class: very deep
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: moderate
Shrink-swell potential: low
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Royosa Soil

Typical Profile
0 to 2 inches—yellowish brown loamy fine sand
2 to 80 inches—light yellowish brown and yellowish brown loamy sand

Soil Properties and Qualities
Parent material: eolian material derived from sandstone
Depth class: very deep
Drainage class: somewhat excessively to excessively
Permeability: very rapid
Available water capacity: low
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: high

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Royosa soils: low available water capacity and hazard of soil blowing
Lindrith soils: hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Lindrith soils: loamy, 036XA006NM
Royosa soils: sandy, 036XA011NM

214—Quimera-Ishkoten complex, 10 to 35 percent slopes

Setting
Landform: hills
Position on landform:
Quimera soils: summits and backslopes, dominantly south-facing
Ishkoten soils: summits and backslopes, dominantly north-facing
Slope:
Quimera soils: 15 to 35 percent
Ishkoten soils: 10 to 35 percent
Elevation: 6,800 to 7,400 feet

Climatic Factors
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Western wheatgrass, muttongrass, prairie junegrass, bottlebrush squirreltail, big sagebrush, Gambel's oak, and scattered ponderosa pine on north aspects

Composition
Quimera soils: 60 percent
Ishkoten soils: 25 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Suposo soils in drainageways
Herm soils on footslopes and benches

Characteristics of the Quimera Soil

Soil Properties and Qualities

Typical Profile
0 to 3 inches—grayish brown very channery clay loam
3 to 15 inches—grayish brown clay loam
15 to 17 inches—dark grayish brown clay
17 inches—sandstone and shale bedrock

Soil Properties and Qualities
Parent material: colluvium and alluvium derived from sandstone and shale
Depth class: shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate

Figure 10.—Typical area of map unit 156, Lindrith-Royosa complex, 2 to 7 percent slopes.

Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Ishkoten Soil

Typical Profile
0 to 0.5 inch—partially decomposed needle and leaf litter
0.5 to 3 inches—brown cobbly loam
3 to 17 inches—yellowish brown and brown clay and clay loam
17 to 24 inches—grayish brown sandy clay loam
24 to 34 inches—weathered shale

Soil Properties and Qualities
Parent material: residuum and slope alluvium from interbedded sandstone and shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: high
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing, wildlife habitat, and urban development

Major Limitations
Quimera soils: depth to bedrock, very low water holding capacity, hazard of water erosion
Ishkoten soils: high shrink-swell potential, hazard of water erosion

Figure 11.—Typical area of map unit 220, Skyvillage-Eslendo-Rock outcrop complex, 3 to 35 percent slopes.

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Quimera soils: mountain shale, 048AY008NM
Ishkoten soils: ponderosa pine woodland

220—Skyvillage-Eslendo-Rock outcrop complex, 3 to 35 percent slopes

Setting
Landform: escarpments, breaks (fig. 11)
Position on landform:
Skyvillage soils: backslopes, ridges, benches
Eslendo soils: backslopes
Rock outcrop: shoulders, knolls, and ridges
Slope:
Skyvillage soils: 3 to 25 percent
Eslendo soils: 3 to 35 percent
Elevation: 6,450 to 7,000 feet

Climatic Factors
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation
Oneseed juniper, blue grama, and galleta

Composition
Skyvillage soils: 30 percent
Eslendo soils: 30 percent
Rock outcrop: 30 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Doakum soils on summits
Councelor soils on toeslopes and drainageways

Characteristics of the Skyvillage Soil

Typical Profile
0 to 4 inches—light yellowish brown sandy loam
4 to 16 inches—yellowish brown sandy loam
16 inches—sandstone

Soil Properties and Qualities
Parent material: sandstone residuum
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Eslendo Soil

Typical Profile
0 to 13 inches—light gray silty clay loam
13 inches—soft calcareous shale

Soil Properties and Qualities
Parent material: residuum from shale and sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Rock outcrop

Sandstone and shale outcrop

Use and Management

Major Uses
Livestock grazing

Major Limitations
Depth to bedrock, steepness of slope, hazard of water erosion, and soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Pinyon juniper woodland

229—Nusmag-Tottles clay loams, 0 to 3 percent slopes

Setting
Landform: stream terraces
Position on landform:
Nusmag soils: treads
Tottles soils: treads
Slope:
Nusmag soils: 0 to 3 percent
Tottles soils: 0 to 2 percent
Elevation: 7,300 to 8,000 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Tufted hairgrass, bluegrass, western wheatgrass, needlegrass, sedges, and rushes

Composition
Nusmag soils: 45 percent
Tottles soils: 35 percent
Contrasting Inclusions: 20 percent

Contrasting Inclusions
Suposo soils on higher valley sides

Characteristics of the Nusmag Soil

Typical Profile
0 to 2 inches—dark grayish brown clay loam
2 to 18 inches—dark grayish brown clay
18 to 80 inches—grayish brown clay

Soil Properties and Qualities
Parent material: alluvium derived from shale
Depth class: very deep
Drainage class: moderately well drained
Permeability: very slow
Available water capacity: high
Shrink-swell potential: high
Reaction: slightly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline
Surface runoff: medium

Hazard of flooding: none
Hazard of water erosion: slight
Hazard of soil blowing: moderate

Characteristics of the Tottles Soil

Typical Profile
0 to 6 inches—dark gray clay loam
6 to 21 inches—dark gray clay
21 to 80 inches—black and dark gray clay

Soil Properties and Qualities
Parent material: alluvium derived from shale
Depth class: very deep
Drainage class: poorly drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to slightly saline
Surface runoff: slow
Depth to water table: 6 to 36 inches
Hazard of flooding: none
Hazard of water erosion: slight
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Slow permeability and high water table

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Nusmag and Tottles soils: mountain meadows, 048AY005NM

231—Sparham clay loam, saline, sodic, 0 to 3 percent slopes

Setting
Landform: flood plains and drainageways
Position on landform: valley floors and drainage bottoms
Elevation: 6,800 to 7,200 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Alkali sacaton, western wheatgrass, galleta, fourwing saltbush, and greasewood

Composition
Sparham soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Lindrith soils on valley sides
Teromote soils on valley sides
Gojiya soils in drainageways

Characteristics of the Sparham Soil

Typical Profile
0 to 2 inches—light yellowish brown clay loam
2 to 35 inches—light yellowish brown clay and pale yellow clay loam
35 to 80 inches—light gray clay

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: deep
Drainage class: well drained
Permeability: very slow
Available water capacity: moderate to high
Shrink-swell potential: high
Reaction: strongly alkaline
Sodicity: slightly to moderately sodic
Salinity: slightly to moderately saline
Surface runoff: slow
Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
High shrink-swell potential, salinity, and sodicity

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
salty bottomland, 036XA010NM

303—Orlie loam, 0 to 8 percent slopes

Setting
Landform: valleys

Position on landform: valley sides and floors
Elevation: 6,900 to 7,400 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, blue grama, Indian ricegrass, needleandthread, big sagebrush, and forbs

Composition
Orlie soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Millpaw soils in swales
Cementlake soils on valley sides and floors

Characteristics of the Orlie Soil

Typical Profile
0 to 2 inches—pale brown loam
2 to 22 inches—brown clay loam
22 to 80 inches—pale brown and brown silty clay loam and clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
None

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
loamy, 036XA006NM

304—Orlie-Nalivag loams, 2 to 8 percent slopes

Setting
Landform: valleys
Position on landform:
Orlie soils: valley sides
Nalivag soils: valley floors and sides
Slope:
Orlie soils: 2 to 8 percent
Nalivag soils: 2 to 4 percent
Elevation: 6,900 to 7,400 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, blue grama, Indian ricegrass, big sagebrush, and forbs

Composition
Orlie soils: 45 percent
Nalivag soils: 35 percent
Contrasting Inclusions: 20 percent

Contrasting Inclusions
Sparham soils on flood plains
Menefee soils on knolls

Characteristics of the Orlie Soil

Typical Profile
0 to 4 inches—-brown loam
4 to 26 inches—brown clay loam
26 to 80 inches—brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic

Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Nalivag Soil

Typical Profile
0 to 3 inches—brown loam
3 to 10 inches—brown sandy clay loam
10 to 39 inches—brown loam and silty clay loam
39 to 80 inches—brown clay loam

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to slightly saline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
None

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Orlie soils: loamy, 036XA006NM
Nalivag soils: loamy, 036XA006NM

310—Rock outcrop-Vessilla-Menefee complex, 15 to 45 percent slopes

Setting
Landform: hills, mesas (fig. 12)
Position on landform:
Rock outcrop: escarpments and ridges
Vessilla soils: breaks, escarpments, and ridges
Menefee soils: breaks, escarpments, and backslopes
Slope:
Rock outcrop: 15 to 45 percent
Vessilla sandy loam: 15 to 45 percent
Menefee clay loam: 15 to 45 percent
Elevation: 6,900 to 7,200 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Pinyon pine, oneseed juniper, blue grama, and western wheatgrass

Composition
Rock outcrop: 40 percent
Vessilla soils: 30 percent
Menefee soils: 20 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Haplustalfs on north aspect backslopes
Badlands on escarpments
Rubbleland on escarpments

Characteristics of Rock outcrop

Rock outcrop consists of sandstone outcrops.

Characteristics of the Vessilla Soil

Typical Profile
0 to 12 inches—brown sandy loam
12 inches—hard sandstone bedrock

Soil Properties and Qualities
Parent material: slope alluvium and colluvium derived from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Menefee Soil

Typical Profile
0 to 2 inch—yellowish brown loam

2 to 6 inches—brown clay loam
6 inches—shale bedrock

Soil Properties and Qualities
Parent material: colluvium and residuum from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Use and Management

Major Uses
Wildlife habitat

Major Limitations
Vessilla and Menefee soils: steep slopes, depth to bedrock, very low available water capacity, and hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Pinyon juniper woodland

340—Riverwash-Kwakina-Tapicito complex, 0 to 3 percent slopes

Setting
Landform: arroyos, flood plains, and low stream terraces (fig. 13)
Position on landform:
Riverwash: arroyo bottoms
Kwakina soils: flood plains, and bars

Figure 12.—Typical area of map unit 310, Rock outcrop-Vessilla-Menefee complex, 15 to 45 percent slopes.

Figure 13.—Typical area of map unit 340, Riverwash-Kwakina-Tapicito complex, 0 to 3 percent slopes.

Tapicito soils: stream terraces

Slope:
Riverwash: 0 to 2 percent
Kwakina soils: 0 to 2 percent
Tapicito soils: 0 to 3 percent

Elevation: 6,450 to 7,300 feet

Climatic Factors

Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 115 to 140 days

Native Vegetation

Indian ricegrass, dropseed, blue grama, galleta, bottlebrush squirreltail, big sagebrush, fourwing saltbush, salt cedar, and cottonwood

Composition

Riverwash: 50 percent
Kwakina soils: 20 percent
Tapicito soils: 20
Contrasting Inclusions: 10 percent

Contrasting Inclusions

Soils that have clayey textured subsoils and seasonal water tables at about 40 inches on floodplains

Wet spots on floodplains

Characteristics of the Riverwash

Riverwash consists of very deep stratified, gravelly, sandy, and loamy materials in active channels that are devoid of vegetation.

Characteristics of the Kwakina Soil

Typical Profile

0 to 2 inches—light yellowish brown loamy sand
2 to 80 inches—light yellowish brown and brown stratified loamy sand and sandy loam

Soil Properties and Qualities

Parent material: stratified alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: somewhat excessively
Permeability: moderately rapid
Available water capacity: low
Shrink-swell potential: low
Reaction: slightly to strongly alkaline
Sodicity: nonsodic
Salinity: nonsaline to slightly saline
Surface runoff: very slow
Hazard of flooding: common
Hazard of water erosion: slight
Hazard of soil blowing: high

Characteristics of the Tapicito Soil

Typical Profile

0 to 3 inches—light yellowish brown very fine sandy loam
3 to 39 inches—brown, pale brown, and light yellowish brown stratified fine sandy loam, very fine sandy loam, and sandy clay loam
39 to 80 inches—pale brown and light yellowish brown stratified loamy sand and loamy fine sand

Soil Properties and Qualities

Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: moderate
Shrink-swell potential: low
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline to slightly saline
Surface runoff: low
Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Riverwash and Kwakina soils: low available water capacity, flooding hazard, and hazard of soil blowing
Tapicito soils: hazard of flooding, hazard of soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Kwakina soils: sandy, 037XA002NM
Tapicito soils: loamy, 037XA001NM

350—Hosta loam, 1 to 5 percent slopes

Setting
Landform: valleys, fans
Position on landform: valley sides, fan summits
Elevation: 6,750 to 7,200 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, blue grama, Indian ricegrass, needleandthread, and big sagebrush

Composition
Hosta soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Orlie soils on valley sides, upper fans
Millpaw soils in swales

Characteristics of the Hosta Soil

Typical Profile
0 to 2 inches—brown loam
2 to 27 inches—grayish brown clay loam
27 to 80 inches—brown or light brownish gray clay loam and loam

Soil Properties and Qualities
Parent material: alluvium derived from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: very high
Shrink-swell potential: high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Slow permeability, high shrink-swell potential

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
loamy, 036XA006NM

370—Orlie fine sandy loam, 1 to 8 percent slopes

Setting
Landform: valleys and mesas
Position on landform: valley sides and mesa summits
Slope: 1 to 8 percent
Elevation: 6,900 to 7,500 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Big sagebrush, western wheatgrass, blue grama, scattered pinyon and juniper

Composition
Orlie soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Lindrith soils on valley sides

Characteristics of the Orlie Soil

Typical Profile
0 to 3 inches—brown fine sandy loam

3 to 18 inches—brown clay loam
18 to 80 inches—brown loam and fine sandy loam

Soil Properties and Qualities
Parent material: alluvium and eolian material derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Hazard of soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
loamy, 036XA006NM

380—Teequee-Menefee-Vessilla complex, 5 to 40 percent slopes

Setting
Landform: hills
Position on landform:
Teequee soils: backslopes, footslopes, toeslopes
Menefee soils: ridges, summits, and backslopes
Vessilla soils: ridges, summits, and backslopes
Slope:
Teequee soils: 5 to 35 percent
Menefee soils: 5 to 40 percent
Vessilla soils: 5 to 25 percent
Elevation: 6,950 to 7,650 feet

Climatic Factors
Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Pinyon pine, ponderosa pine, Gambel's oak, big sagebrush, and western wheatgrass

Composition
Teequee soils: 60 percent
Menefee soils: 15 percent
Vessilla soils: 15 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Rock outcrop on ridges, nose slopes, and steep backslopes
Parkelei soils on backslopes
Ishkoten soils on north-facing backslopes with ponderosa pine
Losindios soils on north-facing toeslopes

Characteristics of the Teequee Soil

Typical Profile
0 to 2 inches—grayish brown cobbly clay loam
2 to 51 inches—brown clay
51 inches—partially weathered gray shale bedrock

Soil Properties and Qualities
Parent material: slope alluvium and residuum from sandstone and shale
Depth class: deep
Drainage class: well drained
Permeability: slow
Available water capacity: moderate
Shrink-swell potential: high
Reaction: neutral to slightly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to slightly saline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Menefee Soil

Typical Profile
0 to 2 inches—light yellowish brown clay loam
2 to 10 inches—light yellowish brown clay loam
10 inches—shale bedrock

Soil Properties and Qualities
Parent material: colluvium derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate

Reaction: neutral to slightly alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to slightly sodic
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Vessilla Soil

Typical Profile
0 to 2 inches—brown fine sandy loam
2 to 10 inches—brown fine sandy loam
10 inches—sandstone bedrock

Soil Properties and Qualities
Parent material: material weathered from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Teequee soils: slow permeability
Menefee soils: depth to bedrock, very low water holding capacity, and hazard of water erosion
Vessilla soils: depth to bedrock, very low water holding capacity, hazard of water erosion and soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Pinyon juniper woodland

390—Losindios-Escrito-Parkelei complex, 3 to 25 percent slopes

Setting
Landform: hillslopes (fig. 14)
Position on landform:
Losindios soils: backslopes, toeslopes
Escrito soils: ridges, shoulders, and nose slopes
Parkelei soils: south-facing backslopes, toeslopes
Slope:
Losindios soils: 3 to 15 percent
Escrito soils: 3 to 25 percent
Parkelei soils: 3 to 15 percent
Elevation: 7,000 to 7,500 feet

Climatic Factors
Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 44 to 46 degrees F
Frost-free period: 90 to 110 days

Native Vegetation
Losindios soils: ponderosa pine, Gambel's oak, western wheatgrass, bluegrass, and big sagebrush
Escrito soils: Rocky Mountain juniper, pinyon pine, ponderosa pine, and Gambel's oak
Parkelei soils: pinyon pine, Rocky Mountain juniper, Gambel's oak, western wheatgrass, and blue grama

Composition
Losindios soils: 35 percent
Escrito soils: 30 percent
Parkelei soils: 25 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Ishkoten soils on north-facing backslopes
Millpaw soils in swales and drainageways
Teequee soils on benches and backslopes
Menefee soils on shoulders and backslopes
Rock outcrop on ridges, shoulders, and nose slopes

Characteristics of the Losindios Soil

Typical Profile
0 to 1 inch—slightly decomposed needle litter
1 inch to 2 inches—brown sandy loam
2 to 37 inches—brown and light yellowish brown sandy clay loam
37 to 80 inches—light yellowish brown sandy loam

Soil Properties and Qualities
Parent material: slope alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none

Figure 14.—Typical area of map unit 390, Losindios-Escrito-Parklei complex, 3 to 25 percent slopes.

Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Escrito Soil

Typical Profile
0 to 4 inches—grayish brown sandy loam
4 to 16 inches—yellowish brown sandy loam
16 inches—hard sandstone bedrock

Soil Properties and Qualities
Parent material: slope alluvium and residuum from sandstone and shale
Depth class: shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Parkelei Soil

Typical Profile
0 to 2 inches—light yellowish brown fine sandy loam
2 to 38 inches—light yellowish brown and yellowish brown sandy clay loam
38 to 80 inches—light yellowish brown sandy loam

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow

Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Losindios soils: livestock grazing, commercial woodland, and wildlife habitat
Escrito and Parkelei soils: livestock grazing, fuelwood, and wildlife habitat

Major Limitations
Escrito soils: depth to bedrock, hazard of water erosion and soil blowing
Losindios and Parkelei soils: hazard of water erosion and soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Losindios soils: ponderosa pine woodland
Escrito soils: ponderosa pine woodland
Parkelei soils: pinyon juniper woodland

403—Vosburg-Millpaw complex, 2 to 8 percent slopes

Setting
Landform: valleys and alluvial fans (fig. 15)
Position on landform:
Vosburg soils: valley sides, floors, and fan summits
Millpaw soils: valley floors, sides, fan summits, and swales
Slope:
Vosburg soils; 2 to 8 percent
Millpaw soils: 2 to 6 percent
Elevation: 7,000 to 7,500 feet

Climatic Factors
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, blue grama, Indian ricegrass, needleandthread, and big sagebrush

Composition
Vosburg soils: 55 percent
Millpaw soils: 35 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Parkelei soils on upper sideslopes
Orlie soils on valley sides and knolls
Jaythree soils in narrow upper drainages

Characteristics of the Vosburg Soil

Typical Profile
0 to 3 inches—brown fine sandy loam
3 to 25 inches—brown sandy clay loam
25 to 35 inches—dark grayish brown sandy clay loam
35 to 80 inches—brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium derived from sandstone shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: slightly acid to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Characteristics of the Millpaw Soil

Typical Profile
0 to 3 inches—brown loam
3 to 23 inches—brown clay and clay loam
23 to 80 inches—pale brown loam

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: high

Figure 15.—Typical area of map unit 403, Vosburg-Millpaw complex, 2 to 8 percent slopes.

Reaction: neutral to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Millpaw soils: hazard of water erosion and slow permeability

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Vosburg soils: loamy, 036XA006NM
Millpaw soils: clayey, 036XA002NM

421—Argiustolls-Ustorthents-Rock outcrop association, 35 to 65 percent slopes

Setting
Landform: dike rock ridges (fig. 16)
Position on landform:
Argiustolls soils: backslopes
Ustorthents soils: backslopes
Rock outcrop: ridgetops
Slope:
Argiustolls: 35 to 50 percent
Ustorthents: 35 to 65 percent

Elevation: 7,000 to 7,400 feet

Climatic Factors
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 90 to 110 days

Native Vegetation
Rocky Mountain juniper, pinyon pine, Gambel's oak, big sagebrush, western wheatgrass, and scattered ponderosa pine

Composition
Argiustolls soils: 45 percent
Ustorthents soils: 35 percent
Rock outcrop: 15 percent
Contrasting Inclusions: 5 percent

Contrasting Inclusions
Ishkoten soils on backslopes

Characteristics of the Argiustolls Soil

Representative Profile
0 to 1 inch—slightly decomposed needle litter
1 inch to 23 inches—dark brown very flaggy loam
23 to 40 inches—brown very flaggy clay loam
40 to 80 inches—brown clay loam and sandy loam

Soil Properties and Qualities
Parent material: colluvium from basalt, sandstone and shale
Depth class: moderately deep to very deep
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Characteristics of the Ustorthents Soil

Representative Profile
0 to 4 inches—dark brown very cobbly sandy loam

Figure 16.—Typical area of map unit 421, Argiustolls-Ustorthents-Rock outcrop association, 35 to 65 percent slopes.

4 to 16 inches—brown cobbly loam
16 to 32 inches—brown very cobbly sandy loam
32 inches—sandstone bedrock

Soil Properties and Qualities
Parent material: colluvium from basalt, sandstone, and shale
Depth class: shallow to deep
Drainage class: well drained
Permeability: moderate
Available water capacity: very low to low
Shrink-swell potential: low
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of Rock outcrop

Rock outcrop consists of elongated basalt dike intrusions which form hogbacks and ridgetops.

Use and Management

Major Uses
Livestock grazing, rock quarry on rock outcrop portion of unit, and wildlife habitat

Major Limitations
Steepness of slope, rock fragments, and hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Pinyon juniper woodland

430—Wilmac-Hosta complex, dry, 2 to 8 percent slopes

Setting
Landform: hillslopes, valleys (fig. 17)
Position on landform:
Wilmac soils: backslopes, and summits
Hosta soils: toeslopes, valley sides
Slope:
Wilmac soils: 2 to 8 percent
Hosta soils: 2 to 8 percent
Elevation: 6,900 to 7,350

Climatic Factors
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass and big sagebrush

Composition
Wilmac soils: 55 percent
Hosta soils: 35 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Menefee soils on ridges and summits
Orlie soils on toeslopes and valley sides

Characteristics of the Wilmac Soil

Typical Profile
0 to 3 inches—grayish brown clay loam
3 to 11 inches—brown clay
11 to 26 inches—pale olive parachannery clay
26 inches—fractured shale

Soil Properties and Qualities
Parent material: slope alluvium and residuum from shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low to moderate
Shrink-swell potential: high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Hosta Soil

Typical Profile
0 to 4 inches—brown clay loam
4 to 17 inches—grayish brown clay
17 to 80 inches—pale brown and light brownish gray clay loam and clay

Soil Properties and Qualities
Parent material: alluvium derived from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: very high
Shrink-swell potential: high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic

Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing

Major Limitations
Wilmac soils: depth to bedrock, slow permeability, high shrink-swell potential
Hosta soils: slow permeability, high shrink-swell potential, hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Wilmac soils: loamy, 036XA006NM
Hosta soils: loamy, 036XA006NM

440—Losindios-Jaythree complex, 3 to 15 percent

Setting
Landform: valleys, low hills
Position on landform:
Losindios soils: backslopes, and valley sides
Jaythree soils: valley bottoms, swales, toeslopes
Slope:
Losindios soils: 3 to 15 percent
Jaythree soils: 3 to 6 percent
Elevation: 7,000 to 7,500 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Gambel's oak, big sagebrush, bluegrass, blue grama, and western wheatgrass

Composition
Losindios soils: 60 percent

Figure 17.—Typical area of map unit 430, Wilmac-Hosta complex, dry, 2 to 8 percent slopes.

Jaythree soils: 20 percent
Contrasting Inclusions: 20 percent

Contrasting Inclusions
Escrito soils on low summits
Ishkoten soils on low hills
Cedarsprings soils in drainageways

Characteristics of the Losindios Soil

Typical Profile
0 to 1 inch—slightly decomposed needle litter
1 inch to 2 inches—brown sandy loam
2 to 37 inches—brown and light yellowish brown sandy clay loam
37 to 80 inches—light yellowish brown sandy loam

Soil Properties and Qualities
Parent material: slope alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Jaythree Soil

Typical Profile
0 to 0.5 inch—pine needle litter
0.5 inch to 2 inches—dark grayish brown sandy loam
2 to 24 inches—dark grayish brown sandy clay loam
24 to 80 inches—light yellowish brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Commercial woodland, livestock grazing, and wildlife habitat

Major Limitations
Losindios soils: hazard of water erosion
Losindios and Jaythree soils: hazard of soil blowing

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

452—Gojiya silty clay, 0 to 3 percent slopes

Setting
Landform: drainageways, lake plains
Position on landform: planar bottoms
Elevation: 6,900 to 7,300 feet

Climatic Factors
Mean annual precipitation: 14 to 16
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Inland saltgrass, western wheatgrass, alkali sacaton, and foxtail barley

Composition
Gojiya soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Fluvents with coarser textures intermixed with the Gojiya soils in upper drainageways

Characteristics of the Gojiya Soil

Typical Profile
0 to 50 inches—grayish brown silty clay
50 to 80 inches—light brownish gray and gray silty clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep

Drainage class: somewhat poorly drained
Permeability: very slow
Available water capacity: high
Shrink-swell potential: high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic to slightly sodic
Salinity: very slightly to moderately saline
Surface runoff: medium
Depth to water table: 50 to 80 inches; seasonally may fluctuate to 20 inches
Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Slow permeability, salinity, and depth to water table

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
salt meadow, 036XA009NM

500—Escrito-Rock outcrop-Dulcepeak, 1 to 15 percent slopes

Setting
Landform: mesas, cuestas, hills
Position on landform:
Escrito soils: summits, shoulders, ridges
Rock outcrop: ridges, knolls, ledges
Dulcepeak soils: backslopes, summits
Slope:
Escrito soils: 1 to 15 percent
Dulcepeak soils: 1 to 15 percent
Elevation: 6,900 to 8,500 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Gambel's oak, Arizona fescue, and western wheatgrass

Composition
Escrito soils: 45 percent
Rock outcrop: 20 percent
Dulcepeak soils: 20 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Herm soils on toeslopes and swales
Haplustalfs soils on narrow canyon and escarpments

Characteristics of the Escrito Soil

Typical Profile
0 to 0.25 inch—slightly decomposed forest litter
0.25 inch to 6 inches—brown and yellowish brown very fine sandy loam
6 to 16 inches—light brown loam
16 inches—hard sandstone bedrock

Soil Properties and Qualities
Parent material: slope alluvium and residuum from sandstone and shale
Depth class: shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: neutral to moderately acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: high

Characteristics of the Rock outcrop

Sandstone on low ridges, ledges, and shoulders to canyons

Characteristics of the Dulcepeak Soil

Typical Profile
0 to 12 inches—pale brown and light yellowish brown fine sandy loam
12 to 25 inches—brown clay
25 inches—sandstone bedrock

Soil Properties and Qualities
Parent material: slope alluvium and residuum derived from sandstone and shale
Depth class: moderately deep
Drainage class: well drained

Permeability: slow
Available water capacity: low
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderate

Use and Management

Major Uses
Commercial woodland, livestock grazing, and wildlife habitat

Major Limitations
Escrito soils: Depth to bedrock, available water capacity, and hazard of soil blowing
Dulcepeak soils: slow permeability, high shrink-swell, depth to bedrock

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

501—Zau-Lomapedro loams, 1 to 15 percent slopes

Setting
Landform: cuestas, mesas, structural benches (fig. 18)
Position on landform:
Zau soils: backslopes, summits
Lomapedro soils: broad summits, swales
Slope:
Zau soils: 1 to 15 percent
Lomapedro soils: 1 to 8 percent
Elevation: 7,500 to 8,650 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Western wheatgrass, mountain muhly,

Figure 18.—Typical area of map unit 501, Zau-Lomapedro loams, 1 to 15 percent slopes.

needleandthread, sideoats grama, Indian ricegrass, Gambel's oak, and forbs

Composition
Zau soils: 55 percent
Lomapedro soils: 35 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Escrito soils on shoulders and ridges
Rock outcrop on shoulders and ridges
Zau soils on 15 to 35 percent slopes

Characteristics of the Zau Soil

Typical Profile
0 to 13 inches—grayish brown and brown loam
13 to 16 inches—yellowish brown loam
16 to 21 inches—yellowish brown clay
21 to 48 inches—weathered sandstone

Soil Properties and Qualities
Parent material: alluvium and residuum derived from sandstone and shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Lomapedro Soil

Typical Profile
0 to 20 inches—dark grayish brown and very dark grayish brown loam
20 to 26 inches—brown clay loam
26 to 37 inches—light brown clay
37 to 52 inches—brownish yellow clay loam
52 inches—soft sandstone bedrock with interbedded shale

Soil Properties and Qualities
Parent material: slope alluvium over sandstone and shale residuum
Depth class: deep
Drainage class: well drained
Permeability: slow
Available water capacity: moderate
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Zau soils: depth to bedrock
Zau and Lomapedro soils: hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
mountain slopes, 048AY006NM

515—Ustorthents-Rock outcrop complex, 35 to 80 percent slopes

Setting
Landform: cuestas, mesas, canyons
Position on landform: escarpments
Slope:
Ustorthents soils: 35 to 80 percent
Elevation: 7,300 to 8,600 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Gambel's oak, pinyon pine, Rocky Mountain juniper, ponderosa pine, true mountainmahogany, and western wheatgrass

Composition
Ustorthents soils: 60 percent
Rock outcrop: 30 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Haplustalfs soils on toeslopes and backslopes
Haplustepts soils on north-facing backslopes

Characteristics of the Ustorthents Soil

Typical Profile
0 to 28 inches—grayish brown and light yellowish brown very cobbly sandy loam

28 inches—dark gray shale bedrock

Soil Properties and Qualities
Parent material: colluvium over shale
Depth class: moderately deep
Drainage class: well drained
Permeability: rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Characteristics of Rock Outcrop

Rock outcrop consists of hard sandstone rimrocks and ledges.

Use and Management

Major Uses
Wildlife habitat

Major Limitations
Steepness of slope, rock fragments, and hazard of erosion, landslide potential near bedrock escarpments

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Pinyon juniper woodland

523—Suposo-Ohwiler loams, 1 to 10 percent slopes

Setting
Landform: valleys, stream terraces
Position on landform:
Suposo soils: valley sides, treads
Ohwiler soils: valley sides, treads
Slope:
Suposo soils: 1 to 6 percent
Ohwiler soils: 3 to 10 percent
Elevation: 6,800 to 8,500 feet

Climatic Factors
Mean annual precipitation: 16 to 18 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Kentucky bluegrass, western wheatgrass, Arizona fescue, sedges, and needlegrass

Composition
Suposo soils: 45 percent
Ohwiler soils: 40 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Jicarilla soils in valley bottoms
Tottles soils in valley bottoms and depressions
Horselake soils on shale knolls
Riverwash in arroyos

Characteristics of the Suposo Soil

Typical Profile
0 to 3 inches—dark grayish brown loam
3 to 11 inches—dark grayish brown clay loam
11 to 50 inches—dark grayish brown clay
50 to 80 inches—grayish brown clay loam

Soil Properties and Qualities
Parent material: alluvium from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: high
Reaction: slightly acid to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Ohwiler Soil

Typical Profile
0 to 7 inches—grayish brown loam
7 to 22 inches—brown loam
22 to 62 inches—grayish brown and light yellowish brown clay loam
62 to 80 inches—grayish brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: high to very high
Shrink-swell potential: moderate

Reaction: slightly acid to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Suposo soils: slow permeability and high shrink-swell potential
Ohwiler soils: none

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
mountain loam, 048AY004NM

524—Jicarilla-Ohwiler association, 1 to 8 percent slopes

Setting
Landform: valleys (fig. 19)
Position on landform:
Jicarilla soils: valley floors
Ohwiler soils: valley sides
Slope:
Jicarilla soils: 1 to 4 percent
Ohwiler soils: 3 to 8 percent
Elevation: 7,200 to 8,000 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Tufted hairgrass, sedges, Kentucky bluegrass, western wheatgrass, needlegrass, and rushes

Composition
Jicarilla soils: 50 percent
Ohwiler soils: 35 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Tottles soils in swales and depressions

Characteristics of the Jicarilla Soil

Typical Profile
0 to 3 inches—very dark gray clay loam
3 to 32 inches—dark gray clay
32 to 42 inches—gray clay
42 to 80 inches—dark gray stratified sandy clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: somewhat poorly drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Depth to water table: 20 to 40 inches, March to June
Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: slight

Characteristics of the Ohwiler Soil

Typical Profile
0 to 7 inches—grayish brown loam
7 to 22 inches—grayish brown and brown loam
22 to 62 inches—grayish brown and light yellowish brown clay loam
62 to 80 inches—grayish brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: high to very high
Shrink-swell potential: moderate
Reaction: slightly acid to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing, native grass hayland, and wildlife habitat

Figure 19.—Typical area of map unit 524, Jicarilla-Ohwiler association, 1 to 8 percent slopes. The forest upland in the background is map unit 540.

Major Limitations
Jicarilla soils: depth to water table, hazard of rare flooding
Ohwiler soils: none

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Jicarilla soils: mountain meadows, 048AY005NM
Ohwiler soils: mountain loam, 048AY004NM

525—Jaythree-Cedarsprings complex, 3 to 15 percent slopes

Setting
Landform: valleys (fig. 20)
Position on landform:
Jaythree soils: valley sides
Cedarsprings soils: valley sides and drainageways
Slope:
Jaythree soils: 3 to 15 percent
Cedarsprings soils: 3 to 8 percent
Elevation: 7,300 to 7,800 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Gambel's oak, bluegrass, elk sedge, and blue grama

Composition
Jaythree soils: 65 percent
Cedarsprings soils: 25 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Losindios soils on higher slopes and fans
Ishkoten soils on low hills

Characteristics of the Jaythree Soil

Typical Profile
0 to 0.5 inch—pine needle litter
0.5 to 2 inches—dark grayish brown sandy loam
2 to 24 inches—dark grayish brown sandy clay loam
24 to 80 inches—light yellowish brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderate
Available water capacity: high
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none

Figure 20.—Typical area of map unit 525, Jaythree-Cedarsprings complex, 3 to 15 percent slopes.

Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Characteristics of the Cedarsprings Soil

Typical Profile
0 to 0.5 inch—slightly decomposed needle and oak litter
0.5 inch to 9 inches—dark gray loam
9 to 19 inches—very dark gray clay loam
19 to 42 inches—light olive brown clay
42 to 80 inches—light yellowish brown sandy clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: high
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Commercial woodland, livestock grazing, and wildlife habitat

Major Limitations
Cedarsprings soils: slow permeability, high shrink-swell potential

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

526—Hetz clay loam, 0 to 3 percent slopes

Setting
Landform: valleys
Position on landform: valley bottoms
Elevation: 6,900 to 7,100 feet

Climatic Factors
Mean annual precipitation: 14 to 16
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Kentucky bluegrass, western wheatgrass, sedges, and rushes

Composition
Hetz soils: 85 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Fine textured soils with high water tables intermixed with the Hetz soils
Vosburg soils on upper valley sides

Characteristics of the Hetz Soil

Typical Profile
0 to 18 inches—dark gray clay loam
18 to 60 inches—light brownish gray clay loam and sandy clay loam
60 to 80 inches—gray sandy clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: somewhat poorly and poorly drained
Permeability: moderately slow
Available water capacity: high to very high
Shrink-swell potential: moderate
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: slow
Depth to water table: 16 to 40 inches
Hazard of flooding: rare
Hazard of water erosion: slight
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing, native hayland, and wildlife habitat

Major Limitations
Depth to water table

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
mountain meadows, 048AY005NM

530—Wilmac-Hosta-Millpaw association, 1 to 10 percent slopes

Setting
Landform: hills and valleys
Position on landform:
Wilmac soils: backslopes, summits
Hosta soils: toeslopes and valley sides
Millpaw soils: valley bottoms, swales, and drainageways
Slope:
Wilmac soils: 1 to 10 percent
Hosta soils: 1 to 8 percent
Millpaw soils: 1 to 4 percent
Elevation: 7,300 to 7,700 feet

Climatic Factors
Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 90 to 110 days

Native Vegetation
Western wheatgrass, prairie junegrass, blue grama, and scattered Rocky Mountain juniper

Composition
Wilmac soils: 45 percent
Hosta soils: 25 percent
Millpaw soils: 15 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Menefee soils on ridges and summits
Cementlake soils in drainageways

Characteristics of the Wilmac Soil

Typical Profile
0 to 3 inches—grayish brown loam
3 to 16 inches—brown clay loam
16 to 38 inches—light brownish gray clay loam
38 inches—fractured, partially weathered shale

Soil Properties and Qualities
Parent material: slope alluvium and residuum from shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low to moderate

Shrink-swell potential: high
Reaction: slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline to slightly saline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Hosta Soil

Typical Profile
0 to 2 inches—brown loam
2 to 27 inches—grayish brown clay loam
27 to 72 inches—brown or light brownish gray clay loam
72 to 80 inches—light brownish gray loam

Soil Properties and Qualities
Parent material: alluvium derived from shale and sandstone
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: slightly to moderately alkaline
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Millpaw Soil

Typical Profile
0 to 3 inches—brown loam
3 to 23 inches—brown clay and clay loam
23 to 80 inches—pale brown loam

Soil Properties and Qualities
Parent material: alluvium derived from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: slow
Available water capacity: high
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing, and wildlife habitat

Major Limitations
Wilmac soils: depth to shale bedrock, slow permeability, high shrink-swell potential
Hosta and Millpaw soils: slow permeability, high shrink-swell potential

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Wilmac soils: mountain slopes, 048AY006NM
Hosta soils: mountain slopes, 048AY006NM
Millpaw soils: mountain loam, 048AY004NM

531—Horselake-Menefee complex, 3 to 25 percent slopes

Setting
Landform: shale hills (fig. 21)
Position on landform:
Horselake soils: backslopes
Menefee soils: ridges, knolls
Slope:
Horselake soils: 3 to 15 percent
Menefee soils: 3 to 25 percent
Elevation: 6,900 to 7,700 feet

Climatic Factors
Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, big sagebrush, low sage, and Rocky Mountain juniper

Composition
Horselake soils: 50 percent
Menefee soils: 30 percent
Contrasting Inclusions: 20 percent

Contrasting Inclusions
Hosta soils in drainageways

Figure 21.—Typical area of map unit 531, Horselake-Menefee complex, 3 to 25 percent slopes.

Millpaw soils in drainageways
Argiustolls soils on higher-elevation backslopes

Characteristics of the Horselake Soil

Typical Profile
0 to 3 inches—brown clay loam
3 to 22 inches—brown clay
22 to 31—dark grayish brown clay
31 to 36 inches—very channery clay loam
36 inches—soft shale bedrock

Soil Properties and Qualities
Parent material: alluvium and residuum from shale
Depth class: moderately deep
Drainage class: well drained
Permeability: very slow
Available water capacity: low to moderate
Shrink-swell potential: high
Reaction: slightly to moderately alkaline
Sodicity: nonsodic to slightly sodic
Salinity: nonsaline to slightly saline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Menefee Soil

Typical Profile
0 to 2 inches—light olive brown loam
2 to 8 inches—light olive brown silty clay loam
8 inches—soft shale bedrock

Soil Properties and Qualities
Parent material: slope alluvium and residuum derived from shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: slow
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly to moderately alkaline
Sodicity: nonsodic to moderately sodic
Salinity: nonsaline to slightly saline
Surface runoff: very rapid
Hazard of flooding: none

Hazard of water erosion: severe
Hazard of soil blowing: moderate

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Horselake soils: depth to bedrock, slow permeability, hazard of water erosion, and shrink-swell potential
Menefee soils: depth to bedrock, very low water holding capacity, hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Horselake soils: mountain shale, 048AY008NM
Menefee soils: pinyon juniper woodland

533—Badland

Setting
Landform: hills
Position on landform: summit, shoulders, footslopes and toeslopes
Slope:
Badland: 25 to 60 percent
Elevation: 6,800 to 7,200 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Widely scattered pinyon pine and oneseed juniper

Composition
Badland: 90 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Menefee soils on ridges

Characteristics of the Badland

Representative Profile
Less than 3 inches of clayey material over weakly consolidated shale. Textures range from clay loam to clay.

540—Ishkoten-Lajuita-Escrito complex, 15 to 60 percent

Setting
Landform: hillslopes, mountain slopes
Position on landform:
Ishkoten soils: backslopes, mountain flanks
Lajuita soils: shoulders, nose slopes, ridges, backslopes, tops and flanks of mountains
Escrito soils: ridges, knolls, backslopes, tops and flanks of mountains
Slope:
Ishkoten soils: 15 to 60 percent
Lajuita soils: 15 to 35 percent
Escrito soils: 15 to 55 percent
Elevation: 7,200 to 8,600 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Gambel's oak, Rocky Mountain juniper, antelope bitterbrush, true mountainmahogany, bluegrass, Arizona fescue, and blue grama

Composition
Ishkoten soils: 45 percent
Lajuita soils: 25 percent
Escrito soils: 20 percent
Contrasting Inclusions: 10 percent

Contrasting Inclusions
Rock outcrop on ridges, knolls, and escarpments
Losindios soils on toeslopes and drainageways
Ustorthents soils on short escarpments

Characteristics of the Ishkoten Soil

Typical Profile
0 to 1 inch—partially decomposed needles and leaf litter
1 inch to 6 inches—brown cobbly sandy loam
6 to 22 inches—brown cobbly sandy clay
22 to 34 inches—strong brown sandy clay loam
34 to 48 inches—partially weathered sandstone

Soil Properties and Qualities
Parent material: slope alluvium over residuum from interbedded sandstone and shale
Depth class: moderately deep

Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: high
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Lajuita Soil

Typical Profile
0 to 1 inch—pine needle litter
1 inch to 3 inches—dark gray cobbly sandy loam
3 to 11 inches—grayish brown sandy clay loam
11 to 15 inches—partially weathered sandstone
15 inches—hard sandstone

Soil Properties and Qualities
Parent material: slope alluvium over residuum from sandstone and shale
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderate
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderate

Characteristics of the Escrito Soil

Typical Profile
0 to 0.5 inch—pine needle litter
0.5 inch to 5 inches—brown sandy loam
5 to 17 inches—yellowish brown and dark yellowish brown sandy loam
17 inches—hard sandstone

Soil Properties and Qualities
Parent material: residuum from sandstone
Depth class: shallow
Drainage class: well drained
Permeability: moderately rapid
Available water capacity: very low
Shrink-swell potential: low
Reaction: slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Commercial woodland, livestock grazing, wildlife habitat

Major Limitations
Ishkoten, Lajuita, and Escrito soils: depth to bedrock, steep slopes, hazard of water erosion
Ishkoten soils: high shrink-swell potential

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

541—Ishkoten-Lajuita complex, north aspect, 15 to 60 percent slopes

Setting
Landform: hillslopes, mountain slopes
Position on landform:
Ishkoten soils: backslopes and mountain flanks
Lajuita soils: ridges, shoulders, nose slopes, backslopes, mountain tops and flanks
Slope:
Ishkoten soils: 15 to 60 percent
Lajuita soils: 15 to 35 percent
Elevation: 7,200 to 8,600 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Douglas fir, Gambel's oak, snowberry, bluegrass, nodding brome, and elk sedge

Composition
Ishkoten soils: 55 percent
Lajuita soils: 30 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Haplustalfs soils on backslopes, mountain flanks
Losindios soils on toeslopes and drainageways
Escrito soils on backslopes and ridges
Rock outcrop on backslopes, knolls, and ridges

Characteristics of the Ishkoten Soil

Typical Profile
0 to 1 inch—partially decomposed needles and leaves
1 inch to 6 inches—dark gray stony sandy clay loam
6 to 13 inches—brown sandy clay
13 to 28 inches—yellowish brown sandy clay
28 inches—partially weathered sandstone

Soil Properties and Qualities
Parent material: slope alluvium and residuum from interbedded sandstone and shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: high
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Characteristics of the Lajuita Soil

Typical Profile
0 to 1 inch—pine needle litter
1 inch to 3 inches—grayish brown cobbly sandy loam
3 to 10 inches—brown sandy clay loam
10 inches—hard sandstone

Soil Properties and Qualities
Parent material: residuum and colluvium from sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderate
Available water capacity: very low
Shrink-swell potential: moderate
Reaction: slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Commercial woodland, livestock grazing, and wildlife habitat

Major Limitations
Ishkoten and Lajuita soils: depth to bedrock, steep slopes, hazard of water erosion
Ishkoten soils: high shrink-swell potential

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Mixed ponderosa pine and Douglas fir woodland

552—Haplustalfs-Argiustolls complex, 25 to 70 percent slopes

Setting
Landform: canyons, cuestas
Position on landform:
Haplustalfs soils: backslopes, escarpments
Argiustolls soils: footslopes, toeslopes
Slope:
Haplustalfs soils: 25 to 75 percent
Argiustolls soils: 25 to 55 percent
Elevation: 7,000 to 8,600 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Douglas fir, Gambel's oak, Arizona fescue, bluegrass, antelope bitterbrush, snowberry, and serviceberry

Composition
Haplustalfs soils: 40 percent
Argiustolls soils: 30 percent
Contrasting Inclusions: 30 percent

Contrasting Inclusions
Haplustepts soils on north aspects and below sandstone bluffs
Ustorthents soils on south-facing backslopes and escarpments
Riparian bottoms
Rock outcrop on knolls, benches, and escarpments
Ishkoten soils on backslopes

Characteristics of the Haplustalfs Soil

Representative Profile
0 to 1 inch—partially decomposed needle litter
1 inch to 5 inches—grayish brown very stony sandy loam

5 to 60 inches—yellowish brown and light yellowish brown very stony sandy clay loam
60 to 80 inches—brown very stony sandy loam

Soil Properties and Qualities
Parent material: colluvium from sandstone and shale
Depth class: moderately deep to very deep
Drainage class: well drained
Permeability: moderate to moderately slow
Available water capacity: low to moderate
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Characteristics of the Argiustolls Soil

Representative Profile
0 to 0.5 inch—partially decomposed needle litter
0.5 inch to 3 inches—very dark gray very stony loam
3 to 22 inches—dark grayish brown and light olive brown very stony clay loam
22 to 43 inches—light olive brown very stony sandy clay loam
43 to 80 inches—light yellowish brown very stony sandy loam

Soil Properties and Qualities
Parent material: slope alluvium and colluvium
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: low to moderate
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: None
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Use and Management

Major Uses
Wildlife habitat

Major Limitations
Steep slopes, stoniness, and hazard of water erosion, landslide potential near bedrock escarpments

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

553—Haplustalfs-Ustorthents complex, 25 to 70 percent slopes

Setting
Landform: canyons, mesas, cuestas, hills (fig. 22)
Position on landform: escarpments, backslopes
Slope:
Haplustalfs soils: 25 to 60 percent
Ustorthents soils: 25 to 70 percent
Elevation: 6,800 to 8,000 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Gambel's oak, Rocky Mountain juniper, true mountainmahogany, antelope bitterbrush, Arizona fescue, and forbs

Composition
Haplustalfs soils: 55 percent
Ustorthents soils: 30 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Rock outcrop on escarpments and knolls
Haplustepts soils on north aspects
Argiustolls soils on footslopes and canyon bottoms
Ishkoten soils on backslopes

Characteristics of the Haplustalfs Soil

Representative Profile
0 to 2 inches—slightly decomposed oak and needle litter
2 to 5 inches—grayish brown very bouldery sandy loam
5 to 17 inches—brown very bouldery sandy clay
17 to 80 inches—yellowish brown very bouldery sandy clay loam

Soil Properties and Qualities
Parent material: colluvium from sandstone and shale
Depth class: moderately deep to very deep
Drainage class: well drained
Permeability: slow to moderate

Figure 22.—Typical area of map unit 553, Haplustalfs-Ustorthents complex, 25 to 70 percent complex.

Available water capacity: low to moderate
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Characteristics of the Ustorthents Soil

Representative Profile
0 to 3 inches—very bouldery brown sandy loam
3 to 8 inches—very stony light brownish gray loam
8 inches—soft shale bedrock

Soil Properties and Qualities
Parent material: residuum and colluvium from shale and sandstone
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderate
Available water capacity: low
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: very rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Use and Management

Major Uses
Wildlife habitat

Major Limitations
Steep slopes, stoniness, hazard of water erosion, landslide potential near bedrock escarpments

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

560—Herm-Dulcepeak complex, 3 to 25 percent slopes

Setting
Landform: cuestas, mesas, hillslopes
Position on landform:
Herm soils: dipslopes, summits, footslopes
Dulcepeak soils: dipslopes, summits, backslopes
Slope:
Herm soils: 3 to 10 percent
Dulcepeak soils: 3 to 25 percent
Elevation: 7,200 to 8,800 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Gambel's oak, Rocky Mountain juniper, snowberry, bluegrass, Arizona fescue, elk sedge, and western wheatgrass

Composition
Herm soils: 45 percent
Dulcepeak soils: 40 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Shallow sandy soils with high organic matter on upper slopes

Characteristics of the Herm Soil

Typical Profile
0 to 4 inches—brown loam
4 to 11 inches—dark grayish brown silt loam
11 to 16 inches—yellowish brown clay
16 to 24 inches—light yellowish brown clay
24 to 80 inches—brownish yellow clay loam

Soil Properties and Qualities
Parent material: slope alluvium from sandstone and shale
Depth class: deep
Drainage class: well drained
Permeability: slow
Available water capacity: high to very high
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Dulcepeak Soil

Typical Profile
0 to 5 inches—dark gray very cobbly loam
5 to 20 inches—brown and strong brown clay
20 to 26 inches—brown gravelly clay loam
26 inches—sandstone bedrock

Soil Properties and Qualities
Parent material: slope alluvium and residuum from sandstone and shale
Depth class: moderately deep
Drainage class: well drained
Permeability: slow
Available water capacity: low
Shrink-swell potential: high
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Commercial woodland, livestock grazing, and wildlife habitat

Major Limitations
Herm soils: slow permeability, high shrink-swell potential, and hazard of water erosion
Dulcepeak soils: depth to bedrock, slow permeability, and high shrink-swell potential

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

571—Orlie-Cementlake complex, 1 to 6 percent slopes

Setting
Landform: valleys (fig. 23)
Position on landform:
Orlie soils: valley sides and floors
Cementlake soils: valley sides and floors

Figure 23.—Typical area of map unit 571, Orlie-Cementlake complex, 1 to 6 percent slopes.

Slope:
Orlie soils: 1 to 6 percent
Cementlake soils: 1 to 4 percent
Elevation: 6,900 to 7,400 feet

Climatic Factors
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 130 days

Native Vegetation
Western wheatgrass, blue grama, alkali sacaton, low sagebrush, and big sagebrush

Composition
Orlie soils: 50 percent
Cementlake soils: 35 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Lindrith soils on valley sideslopes near sandstone rock outcrops
Shallow sodium-affected soils on knolls and toeslopes of badlands

Characteristics of the Orlie Soil

Typical Profile
0 to 2 inches—pale brown loam
2 to 22 inches—brown clay loam
22 to 80 inches—pale brown and brown silty clay loam and clay loam

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: very high
Shrink-swell potential: moderate
Reaction: neutral to slightly alkaline
Sodicity: nonsodic
Salinity: nonsaline

Surface runoff: medium
Hazard of flooding: rare
Hazard of water erosion: moderate
Hazard of soil blowing: slight

Characteristics of the Cementlake Soil

Typical Profile
0 to 1 inch—very pale brown sandy loam
1 inch to 17 inches—brown and yellowish brown sandy clay
17 to 32 inches—grayish brown clay loam
32 to 80 inches—grayish brown stratified sandy clay loam and sandy clay

Soil Properties and Qualities
Parent material: alluvium from sandstone and shale
Depth class: very deep
Drainage class: well drained
Permeability: very slow
Available water capacity: moderate to high
Shrink-swell potential: moderate to high
Reaction: slightly to moderately alkaline
Sodicity: moderately sodic
Salinity: nonsaline to very slightly saline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: moderate
Hazard of soil blowing: moderately high

Use and Management

Major Uses
Livestock grazing and wildlife habitat

Major Limitations
Cementlake soils: sodicity and slow permeability

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Range Site:
Orlie soils: loamy, 036XA006NM
Cementlake soils: salty bottomland, 036XA010NM

580—Archmesa-Skyute complex, 1 to 25 percent slopes

Setting
Landform: mesas
Position on landform:
Archmesa soils: undulating summits
Skyute soils: ridges, breaks
Slope:
Archmesa soils: 1 to 20 percent
Skyute soils: 1 to 25 percent
Elevation: 8,200 to 8,600 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Douglas fir, Arizona fescue, and forbs

Composition
Archmesa soils: 60 percent
Skyute soils: 25 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Rock outcrop on knolls and low ridges
Ohwiler soils in swales

Characteristics of the Archmesa Soil

Typical Profile
0 to 10 inches—brown loam
10 to 35 inches—brown and yellowish brown clay loam
35 inches—hard sandstone bedrock

Soil Properties and Qualities
Parent material: slope alluvium and residuum from andesite
Depth class: moderately deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: low to moderate
Shrink-swell potential: moderate
Reaction: neutral to slightly acid
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: rare
Hazard of water erosion: severe
Hazard of soil blowing: slight

Characteristics of the Skyute Soil

Typical Profile
0 to 9 inches—brown loam
9 to 17 inches—yellowish brown and light yellowish brown clay loam
17 to 21 inches—hard andesite

Soil Properties and Qualities
Parent material: andesite residuum
Depth class: very shallow and shallow
Drainage class: well drained
Permeability: moderately slow

Available water capacity: very low
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: medium
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: slight

Use and Management

Major Uses
Livestock grazing, commercial woodland and wildlife habitat

Major Limitations
Archmesa and Skyute soils: depth to bedrock and hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

590—Abreu family-Rubbleland-Rock outcrop complex, 35 to 80 percent slopes

Setting
Landform: mesas (fig. 24)
Position on landform: escarpments
Slope:
Abreu soils: 35 to 60 percent
Rubbleland: 35 to 80 percent

Figure 24.—Typical area of map unit 590, Abreu family-Rubbleland-Rock outcrop complex, 35 to 80 percent slopes.

Elevation: 7,800 to 8,600 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Ponderosa pine, Gambel's oak, Arizona fescue, and bluegrass

Composition
Abreu family soils: 65 percent
Rubbleland: 15 percent
Rock outcrop: 15 percent
Contrasting Inclusions: 5 percent

Contrasting Inclusions
Argiustolls soils on canyon bottoms and benches

Characteristics of the Abreu Family Soil

Typical Profile
0 to 6 inches—very stony grayish brown loam
6 to 41 inches—very stony yellowish brown clay loam
41 to 80 inches—pale brown very stony sandy clay loam

Soil Properties and Qualities
Parent material: colluvium from andesite
Depth class: moderately deep to deep
Drainage class: well drained
Permeability: moderately slow
Available water capacity: low to moderate
Shrink-swell potential: low
Reaction: slightly acid to neutral
Sodicity: nonsodic

Figure 25.—Typical area of map unit 600, Haplustepts-Haplustalfs complex, 35 to 75 percent slopes.

Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Characteristics of the Rubbleland

Andesite talus, stones, and boulders

Characteristics of the Rock outcrop

Andesite mesa cap rock

Use and Management

Major Uses
Wildlife habitat

Major Limitations
Steep slopes, stoniness, and hazard of water erosion

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Ponderosa pine woodland

600—Haplustepts-Haplustalfs complex, 35 to 75 percent slopes

Setting
Landform: north-facing mesa and canyon slopes and escarpments (fig. 25)
Position on landform:
Haplustepts soils: upper backslopes
Haplustalfs soils: backslopes and footslopes
Slope:
Haplustepts soils: 35 to 75 percent
Haplustalfs soils: 35 to 65 percent
Elevation: 7,300 to 9,000 feet

Climatic Factors
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 42 to 45 degrees F
Frost-free period: 80 to 100 days

Native Vegetation
Douglas fir, ponderosa pine, Gambel's oak, snowberry, Oregon grape, and serviceberry

Composition
Haplustepts soils: 50 percent
Haplustalfs soils: 35 percent
Contrasting Inclusions: 15 percent

Contrasting Inclusions
Rock outcrop as rimrocks and knolls
Ustorthents soils below sandstone rock outcrop
Argiustolls soils on footslopes and drainageways
Rubble land on escarpments

Characteristics of the Haplustepts Soil

Representative Profile
0 to 1 inch—partially decomposed needle litter
1 inch to 5 inches—grayish brown very stony loam
5 to 43 inches—light brownish gray and pale brown very stony loam
43 inches—hard sandstone bedrock

Soil Properties and Qualities
Parent material: colluvium from sandstone
Depth class: moderately deep to very deep
Drainage class: well drained
Permeability: moderate to moderately rapid
Available water capacity: low to moderate
Shrink-swell potential: low
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Characteristics of the Haplustalfs Soil

Representative Profile
0 to 2 inches—slightly decomposed oak and needle litter
2 to 4 inches—grayish brown very stony sandy loam
4 to 14 inches—light olive brown very stony sandy clay
14 to 80 inches—light olive brown very stony sandy clay loam

Soil Properties and Qualities
Parent material: colluvium from sandstone and shale
Depth class: moderately deep to very deep
Drainage class: well drained
Permeability: slow to moderate
Available water capacity: low to moderate
Shrink-swell potential: moderate
Reaction: neutral
Sodicity: nonsodic
Salinity: nonsaline
Surface runoff: rapid
Hazard of flooding: none
Hazard of water erosion: severe
Hazard of soil blowing: very slight

Use and Management

Major Uses
Wildlife habitat

Major Limitations
Steep slopes, stoniness, and hazard of water erosion, potential for slump in localized areas after heavy winter precipitation

For general and detailed information concerning managing the unit, see the Use and Management section of the manuscript.

Interpretive Groups
Douglas fir woodland

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, slightly limited, somewhat limited,* and *very limited.* The suitability ratings are expressed as *well suited, moderately well suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor.*

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

Doug Treadway, District Conservationist, and Jill Mumford, Soil Conservationist, Natural Resources Conservation Service, assisted with the preparation of this section.

This section discusses general management needed for crops and pasture. It explains the system of land capability classification used by the Natural Resources Conservation Service and describes prime farmland.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be

obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

In the survey area, about 325 irrigated acres and about 5,000 acres nonirrigated native hayland are in cropland. The major concerns are the hazard of water erosion, fluctuating water tables, flooding, and elk feeding on crops.

Water erosion may be controlled by maintaining crop residue on or near the surface, establishing long term cover grass or legumes, land leveling or smoothing, and sprinkler irrigation. Rill irrigation erosion can be controlled using irrigation water management and irrigation erosion control.

High water tables can be overcome by crop selection and irrigation water management. Management of drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

Flooding may be controlled by diversions, dikes and levees.

Fertilization

All crops except for legumes generally respond to nitrogen fertilizer. Cropland and hayland or pasture may respond to fertilization. On cropland areas, soils should be tested at least every other year to determine nutrient levels and the need for fertilizer. Because of the high pH (alkaline) of upland soils, some trace elements such as iron and zinc may become limiting. Forested soils may be slightly acid. Selecting plants that are suited to the soil conditions will assure productive crops.

Most of the soils in the area have a moderate to high content of native organic matter. Using barnyard manures, growing green manure crops which are plowed under, or returning large amounts of crop residues to the soil are all beneficial practices that maintain good organic matter levels.

Irrigation

Irrigation water management consists of determining and controlling the proper rate, amount, and timing of irrigation water. To achieve proper irrigation water management, it is desirable to have a well-designed conservation irrigation system based on the characteristics of the soil and the crops to be grown. Timely application of water without over-irrigating is essential to obtain high yields and to conserve water. To irrigate properly, the farmer should know how much water the soil will hold, how deeply plant roots penetrate, and how much water the crop requires. Most crops should be irrigated when 40 to 50 percent of the available soil moisture has been depleted. The "feel method," using a soil probe, auger, or even a shovel, can be used to determine the moisture content of the root zone.

The most visible symptoms of moisture stress in plants are wilting leaves or leaves that take on a bluish cast. More drought-tolerant plants exhibit a slower rate of growth. The soil profile should be checked about 48 hours after irrigation to determine if the water has reached the desired depth and if it was applied uniformly. This simple check can reveal many problems of which the producer would otherwise be unaware. In the survey area, irrigation water management using outdated systems may approach 15 to 35 percent efficiency under the best of conditions. The border and contour ditch methods are the primary irrigation methods used in the survey area. The border method, which consists of surface flooding between low dikes on leveled land, is most widely used for alfalfa, pastures, and small grains. Contour ditch irrigation is used for irrigated pasture, hay, and small grains on moderate to steep terrain where slopes range up to 10 percent. This method consists of a series of ditches on a suitable grade following the contour of the land. These ditches are generally spaced about 100 to 300 feet apart. The land between the ditches is irrigated by controlled flooding.

Installing sprinklers, drip irrigation, irrigation pipelines, or terraces should be used where practical to conserve water, improve efficiency, minimize erosion, and increase productivity. Other suitable practices are ditch lining and leveling and smoothing the land.

Tillage

The soils in this survey area often have weak structure or poor tilth. Tilling when the soil is wet breaks down the soil structure and compacts the soil, which restricts the movement of air and water into the root zone. When farm equipment is driven over wet soil, the weight of the equipment causes a compacted layer, usually called a plowpan or tillage pan, to develop several inches below the surface. This 1- to 2-inch thick, tightly compressed layer restricts water intake and is often so dense that plant roots have difficulty penetrating it. Tillage should be performed at varying depths, and only when the soil is dry, to prevent formation of a plowpan. The effect of such a pan can be corrected by chiseling or subsoiling and by growing deep-rooted crops such as alfalfa. Using a grass crop in a long-term rotation also helps eliminate such restrictive layers. The practice of minimum tillage limits the number of trips over the field to only those

that are essential, and this prevents soil damage. Growing green manure crops, crops that are plowed under, is also very beneficial to these soils. Both of these practices can improve soil tilth, improve the water intake rate, and improve the soil structure. Minimum tillage also lowers operating costs.

Alfalfa Production

Alfalfa may produce up to 3.5 tons per acre in the survey area. Alfalfa stands that have a density of less than 4 to 5 plants per square foot are generally not profitable and can be grassy and weedy. Such stands should be rotated out of alfalfa for 1 to 2 years before being replanted to alfalfa.

When planting alfalfa, the following considerations apply: 1) avoid soils that have a high water table; 2) select the best-suited varieties; 3) prepare a good seedbed; 4) soil test and incorporate phosphorus fertilizer before planting; 5) control weeds (fall seedings have fewer weed problems); 6) use correct seeding rate (rates vary depending on variety and seeding method); 7) do not use a companion crop unless needed to prevent soil blowing; and 8) control insects at the proper time.

After a good stand is established, maintain the stand by cutting at about 1/10 bloom. This is a compromise which provides good quality and quantity without damaging the stand.

Pasture and Grass Hay Production

Pasture and grass hay are important land uses in this survey area. The area is well-suited to cool-season grasses. Intermediate wheatgrass, pubescent wheatgrass, western wheatgrass, tall wheatgrass, tall fescue, Reed canarygrass, orchardgrass, meadow bromegrass, timothy, smooth brome, and alsike clover are preferred species for this area.

Grass hay may yield 3 to 4 tons per acre in the survey area. For optimum production, grass and legume species should be selected for palatability, high production, and suitability for the soil and climatic conditions of the area. Information on seedbed preparation, improved varieties of each species, soil adaptation, and seeding methods is available in the local Natural Resources Conservation Service office or from the Cooperative Extension Service.

Periodic renovation, soil testing and fertilizer application, weed and brush control, and proper grazing management on pasture areas should be practiced to maximize production. Irrigation water should be applied using a properly designed irrigation system to control erosion, conserve water, and provide the optimum amount of water for plant growth.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the United States has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive, and cannot be easily cultivated.

There are no prime farmland soils in the Jicarilla Apache Reservation survey area. Climate, soil erodibility hazards, sodicity, and/or depth to seasonal high water table exceed the acceptable levels for prime farmlands. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

Because the acreage of cropland in the Jicarilla Apache area is small and crop yield data is limited, land capability classes have not been tabularized. Further information on land capability classes and local crops is available at the local office of the Natural Resources Conservation Service.

Rangeland

Andrea LeFevre, Rangeland Management Specialist, Bureau of Indian Affairs, assisted with the preparation of this section.

Rangeland is land on which the historic climax plant community is predominately grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. The kind and amount of vegetation produced on rangeland depends on the climate and topography and is closely related to the kind of soil in the area. The majority of the reservation is rangeland consisting of grasses, forbs, and shrubs. The rest of the acreage is woodland consisting of pinyon, juniper, ponderosa pine, spruce and fir, which produce understory vegetation that is suitable for grazing.

When the plant community has been characterized for each soil mapping unit, similar plant communities are grouped into ecological sites. An ecological site is a distinctive kind of rangeland which produces a characteristic natural plant community that differs from other natural plant communities in kind, amount, or proportion of range plants. The dominant plant or plants are used to characterize the plant community because

of their relative stability where abnormal disturbance or physical site deterioration has not occurred. Ecological site descriptions can be used to estimate percentages of the total annual production of each plant.

In areas that have similar climate and topography, differences in the kind and amount of rangeland or forest understory vegetation produced are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Table 5 shows, for each soil that supports rangeland vegetation, the ecological site and the historic annual production of vegetation in favorable, normal, and unfavorable years. An explanation of the column headings in table 5 follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species, or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well-managed rangeland that is supporting the historic climax plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Table 6 shows, for each soil that supports vegetation suitable for grazing, the ecological site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in table 6 follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well-managed area that is supporting the historic climax plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic vegetation is the grasses, forbs, and shrubs that make up most of the historic climax plant community on each soil is listed by common name. Under *composition: range and forest understory*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires a knowledge of soil and plant community dynamics. It also requires an evaluation of range health, present range similarity index, and rangeland trend. Range health is determined by assessing if the ecological processes of soil

stability, plant community dynamics, and watershed functions are intact and/or functioning. Range similarity index is determined by comparing the present plant community with the historic climax plant community or desired plant community on a particular rangeland ecological site. The more closely the existing community resembles the historic climax community, or desired plant community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the historic climax plant community. Further information about range health, range similarity index, and rangeland trend is available in chapter 4 of the National Range and Pasture Handbook, which is available in local offices of the Natural Resources Conservation Service.

Usually the objective in range management is to manage grazing so that the plants growing on a site are about the same in kind and amount as the historic climax plant community. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, management for a desirable plant community other than the historic climax plant community meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Historical Use of Rangeland

Between the years of 1850-1907, most of the Jicarilla Apache people were located in the upper Rio Grande Valley and in the foothills bordering the Rio Chama in northern New Mexico. Before the land became an Indian reservation, the northern portion was used to practice small-scale agriculture by the Jicarilla. In the southern half of the reservation, two prominent families controlled most of the acreage from Companero Canyon south to what is now Cuba. Their dominance of this area dates back to 1880 and continued to 1908, when the Jicarilla Nation was given use of the southern area. In the early 1900s, these lands were used mainly to graze sheep. In 1919, the U.S. government delivered livestock to the Nation, and the livestock industry flourished on the Reservation. The southern portion was then used to graze cattle and sheep. Approximately 35,000 sheep and 2,300 cattle were grazing on the reservation in 1930. At that time, sheep were the mainstay of the Jicarilla Indians.

In the first years after establishment of the reservation, herds were quite small. Tribal livestock operations gradually became more proficient in the sheep business, and their herds grew. The Nation began a seasonal distribution between the northern and southern parts of the reservation. By 1944, it was estimated that 39,000 sheep grazed the reservation.

During this time, livestock producers rarely implemented range improvements. Their income was not sufficient to cover both household expenses and care of their livestock. Usually, the livestock producer would rotate the herd in areas to graze and monitor how much they grazed before moving them to another area.

With the nationwide decline in the sheep industry, loss of the railroad for shipping herds, and a significant change in the Jicarilla lifestyle, highly visible adverse grazing impacts were reduced. Today, there are less than 100 head of sheep on the reservation. Cattle are the main type of livestock operated, but the livestock producers do not rely on them for their entire household income. Many livestock producers are employed in Dulce working for the Jicarilla Apache Nation. In 1988, there were an estimated 4,900 head of cattle grazing the reservation. In 1998, approximately 6,000 head of cattle were estimated to be grazing on the reservation.

When the reservation was established, elk had very little impact on the rangelands. There was also very little competition between livestock and wildlife for forage, as there is today. Over time, elk numbers have increased dramatically across northern New Mexico and southwestern Colorado. The Jicarilla Department of Natural Resources has estimated that 4,800 head of elk summer on the reservation. Summer mule deer populations were estimated to be 5,700 head. The winter populations of deer and elk vary depending on the snow depth.

The reservation is divided into 90 range units and each varies in acreage. Most of the range units are summer and winter ranges. Topographical features were used to divide up most of the range units. The carrying capacity that is currently used for each range unit is based on the 1969 soil and range inventory. Grazing is administered through the Jicarilla Apache Range Code, which was implemented in 1979 by the Tribal Council to preserve and improve the range and water resources of the Jicarilla Apache Reservation.

Present day range management practices are influenced by vegetation, land topography, herd size, and the operator's ranching experience. Approximately 15 percent of the range units have perimeter fencing, and less than 5 percent have interior fencing. The majority of the reservation is open range, making effective range management difficult.

Major range improvements must be approved by the tribal authorities before being implemented. Over time, some of the livestock producers have established fences around their range unit to manage their cattle more efficiently. They also have installed more

watering facilities and have implemented practices such as brush management, range seeding, and resting the unit from livestock grazing.

Forest Productivity and Management

Forests cover about 75 percent of the Jicarilla Apache Area. About 91,000 acres are intensively managed for timber (USDI, 1996). The commercial harvest on these producing lands is approximately 90 percent ponderosa pine and 10 percent Douglas fir (Jicarilla Apache Nation, 1999). The remaining forested acres are characterized as inaccessible timber, unregulated timberland, and pinyon juniper woodland. Woodlands provide fuel wood, posts, poles, pinyon nuts, and Christmas trees to the local people. They are also used for big game hunting, livestock grazing, and wildlife habitat.

The Jicarilla Apache Reservation commercial timber forest is comprised primarily of the ponderosa pine (Pinus ponderosa) cover type of the Rocky Mountain Inland variety. This forest type accounts for more than 90 percent of the existing commercial forest, and exists for the most part as a ponderosa pine-Gambel oak (Pipo/Quga) habitat type. The other primary forest cover type, comprising less than 10 percent of the commercial forest, is Douglas fir (Pseudotsuga menziessi). This forest type is found mainly on north aspects, steep slopes, and in cool moist drainages. Isolated mixed conifer stands, containing ponderosa pine, Douglas fir, White fir (Abies concolor), and, in rare cases, Englemann Spruce (Picea engelmanni) can be found on high mesa tops and in some steep, cold, high elevation drainages. The southern half of the reservation is comprised almost entirely of noncommercial woodlands composed of juniper species and pinyon pine (Pinus edulis) (USDI,1996).

Management concerns include sustained yield, fire management, including prescribed burns and wildfire control, erosion control along unimproved roads, and reforestation. Under the uneven aged silvicultural management that is currently practiced, trees of multiple ages remain after harvesting (USDI, 1995).

The tables in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forest management.

In table 7, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the National Forestry Manual, which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, expressed as a number, is the yield likely to be produced by the most important tree species. This number is expressed in as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI). It indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

In tables 8a, 8b, 8c, and 8d, interpretive ratings are given for various aspects of forest management. The ratings are both verbal and numerical. Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately well suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified forest management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for forest management practices. More detailed information about the criteria used in the ratings is available in the National Forestry Manual, which is available in local

offices of the Natural Resources Conservation Service or on the Internet.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

The ratings of *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Ratings in the column *hazard of off-road or off-trail erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance; and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation will be completed before seedlings are planted.

Ratings in the column *suitability for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The soil profile from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The soil profile from the surface to a depth of about 3 feet is considered in the ratings.

Woodland Understory Vegetation

Understory vegetation consists of grasses, forbs, shrubs, and other plants. If well managed, some woodland can produce enough understory vegetation to support grazing of livestock or wildlife, or both, without damage to the trees.

The density of the canopy determines the amount of light that reaches the understory plants. Canopy cover is a major factor affecting the production of vegetation that is within reach of livestock and large game animals. Livestock management and good silvicultural practices such as thinning of timber stands, removal of cull trees, and controlled burning are necessary to maintain moderate to good production of understory vegetation. Without the proper management practices, the canopy cover increases drastically because of the growth of shrubs and hardwoods in the midstory. A site that has a closed canopy of 75 percent or more may not have sufficient carrying capacity for a profitable livestock operation. Use of the area by large game animals will be limited because sufficient browse plants are not available.

The quantity and quality of understory vegetation vary with the kind of soil, the age and kind of trees in the canopy, the density of the canopy, and the depth and condition of the litter.

In addition to proper woodland management, the following practices can help achieve high levels of forage production.

Proper woodland grazing is managed at an intensity that maintains or improves the quantity and quality of desirable plants. It is generally thought to be grazing of no more than half, by weight, of the annual growth of key forage plants in preferred grazing areas. Proper grazing increases the vigor and reproductive capacity of key forage plants, conserves soil and water, improves the condition of the vegetation, increases forage production, maintains natural beauty, and reduces the hazard of wildfire.

Deferred grazing consists of postponing grazing or resting the grazing land for a prescribed period. The rest period promotes the growth of natural vegetation by permitting the vigor of the forage to increase and by allowing desirable plants to seed. Deferred grazing provides feed reserves for fall and winter, improves the appearance of land by having more vegetative cover, and reduces the hazard of erosion.

Planned grazing systems are systems in which two or more grazing units are rested in a planned sequence throughout the year or during the growing season of key forage plants. These systems improve the production of desirable forage plants and trees.

Prescribed burning is the use of fire under controlled conditions. It can be used to control undesirable vegetation, increase production by removal of part of the organic layer, reduce the hazard of wildfire, and remove old, unpalatable forage plants.

Table 6 lists for each soil, the common names and percentage of understory plants expected under a canopy density that is most nearly typical of woodland in which the production of wood crops is highest.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 9 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 9 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in tables 10a and 10b according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be

overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in tables 10a and 10b can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and

some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 11, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, and cherry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, fir, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland

plants are smartweed, saltgrass, cattail, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include quail, pheasant, meadowlark, field sparrow, cottontail, red fox, and coyote.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, sage grouse, meadowlark, and mountain bluebird.

Wildlife in the Survey Area

Jim Wolf, Range Conservationist, Bureau of Indian Affairs, assisted with the preparation of this section.

The Jicarilla Apache Reservation is widely known for its abundant wildlife. Elk and deer are distributed throughout the reservation, with the highest concentration being on the northern half. As of the year 2000, management objectives had stabilized the summer elk population at approximately 3,000 head. The summer mule deer herd numbers about 3,500 to 4,000 animals. Winter populations for both species vary greatly, depending on the severity of the winter. Elk herds from Colorado often migrate to the reservation when summer ranges become covered with snow. During severe winters, excessive snow depths may force Jicarilla elk to migrate south and west off the reservation. A 14,500-acre fenced game park where elk are intensively managed is located 15 miles southeast of Dulce on Horse Lake Mesa.

Deer and elk hunting are economically important to the Jicarilla Nation, as considerable income is generated from license and guide fees. Local stores, hotels, and restaurants also benefit from hunting.

A small herd of antelope resides on the sagebrush rangelands near the southern boundary of the reservation. Prior to 1990, Barbery sheep had moved onto the reservation from public lands to the west. However, the last confirmed sighting of one occurred in 1992. The diets of Barbery sheep and mule deer are quite similar, and they may compete for browse if sheep populations become too high.

Black bear, mountain lion, bobcat, and coyote represent the major predators. Several lakes on the northern half provide nesting areas for waterfowl. Some of the largest concentrations of waterfowl in the southwest occur when migrating birds stop over on the Jicarilla lakes prior to freeze-up. Many species of small game occur, including wild turkey, mourning dove, and cottontail rabbits. Nongame mammal species include Aberts squirrel, porcupine, blacktail jackrabbit, striped skunk, bat (spp.), spotted ground squirrel, badger, and blacktailed prairie dog.

Reptiles include prairie rattlesnake, collared lizard, shorthaired lizard, and bullsnake.

Various species of raptors, including the redtail hawk, American kestrel, and Coopers hawk, are common. Threatened or endangered raptors include the golden eagle, bald eagle, and possibly the peregrine falcon, Mexican spotted owl, and Southwestern willow flycatcher. Bald eagles are often seen on the reservation during the winter. Other avian species include scrub jay, Stellar's jay, pinyon jay, Northern harrier, common raven, horned lark, black-billed magpie, Western bluebird, Western meadowlark, starling, robin, buntings, red-winged blackbird, white crowned sparrow, and several species of hummingbird. Other migratory birds passing through the area include the Oregon junco, grayhooded junco, American goldfinch, and indigo bunting.

The Navajo River in the extreme northern portion of the reservation looks much different today than in years past. The river that once teemed with native Colorado cutthroat trout and roundtail chubs now hosts numerous non-native fish, such as carp, white suckers, and bullheads.

Natural and manmade lakes on the Jicarilla lands include the Dulce Enbom, Hayden, Stone, La Jara, Mundo, and Horse Lakes. Through agreement with the U. S. Fish and Wildlife Service, these lakes are stocked annually with rainbow trout, cutthroat trout,

brown trout, brook trout and catfish. Trophy-sized rainbow trout are common in some of the more prominent lakes.

Hunting and fishing seasons are permitted and regulated by the Jicarilla Apache Tribal Fish and Game Department.

Habitat Requirements

Wildlife populations are generally controlled by the amount of available food, cover, and water. Each species has unique habitat requirements that vary with the season of the year. More food is required during winter and reproductive periods. Protection from winter storms is also a necessity for most species (Hoover and Wills, 1984).

The kind of soil present in an area affects the types of vegetation available to wildlife for food and cover. Soil type may also affect the availability of water, since soils vary in their water-holding capacity and suitability for water catchment.

The types of foods wildlife consume depend on their availability, palatability, and the nutritional requirements of the animal.

Mule deer prefer highly nutritious forbs and newly formed buds on shrubs in the spring. In the winter deer rely on twigs from shrubs and even conifers because these may be the only foods available. Excessive snow depths may cause shrubs to become unavailable, and deer are forced to migrate to new areas.

The palatability of wildlife foods varies among different plant species. Deer are classed as intermediate feeders because they utilize both shrubs and grasses. Elk prefer grasses over shrubs. As the seasons advance, food preferences may change as changes in the physical and chemical composition of plants make them less palatable.

The nutritional quality of forage directly affects the condition of wildlife. Reproductive success and winter survival depend not only on the quantity of available forage but upon the nutritive quality of the forage as well. In general, fertile soils produce forage of higher nutritional value to wildlife (Bailey, 1984)

Wildlife need cover for shelter from weather, and to escape and hide from predators. Cover that provides shelter from weather, or thermal cover, may be dead snags, rock outcrops, or dense vegetation types.

Wildlife use hiding cover to give birth to young, escape enemies, sleep or roost, and travel to and from feeding areas (Hoover and Wills, 1984)

Turkeys require old growth ponderosa pine with open tops for roosting sites. Deer and elk seek out dense vegetation for bedding areas. Tall grass and sagebrush conceal newborn pronghorn fawns.

Cover requirements vary for each wildlife species with the season. Calving grounds that conceal newborn elk in May and June become less critical habitat in September. During severe winters, mule deer seek south-facing slopes which they may seldom use in the remainder of the year.

Water is a necessary dietary component for all animals. Water sources include succulent vegetation, snow, and surface water. The type of soil in an area often influences water availability. For example, sandy, coarse-textured soils hold little water and are not well suited for construction of earthen tanks in areas where lack of water is a limiting factor.

The mere presence of food, cover, and water alone do not necessarily constitute suitable wildlife habitat. All three habitat factors must be interspersed in such a manner that wildlife can utilize them. Elk prefer forest openings of 10 to 30 acres (Hoover and Wills, 1984). Such a setting contains foraging areas adjacent to hiding cover and escape routes. If water is available, the major requirements for suitable elk habitat exist. Conversely, an extremely large open area with excellent forage may be unsuitable habitat because of the lack of hiding cover or adjacent water.

Habitat Management

If the soil has the potential, vegetation can be manipulated to enhance wildlife habitat for a single species or a group of species. Managing vegetation is often the most practical means for maintaining and or improving habitat quality.

In order to predict habitat response to range and forest management practices, it is important to know the potential natural vegetation that occurs on a particular soil type. During the soil survey, soil-mapping units were grouped into range sites and forest cover types. Correlation to New Mexico range site descriptions and ecological site descriptions provides potential plant community composition. This information allows habitat managers to predict the plant communities that might occur in the survey area under various management strategies.

It is also important to know the habitat requirements of wildlife species before implementing management practices designed to improve habitat. Deer usually prefer vegetation types in early successional status such as recently burned areas. However, it might not be advisable to practice prescribed burning in sagebrush to benefit deer if the burned area encompasses a critical sage grouse nesting ground.

The detailed soil mapping unit descriptions give information about potential natural vegetation and soil type.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Tables 12a and 12b show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use

(1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Tables 13a and 13b show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by

special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between a depth of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils, the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Groundwater contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Tables 14a and 14b give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

The soils are rated *good, fair*, or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a *probable* or *improbable* source of sand and gravel. A rating of *probable* means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 14a, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter

content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, a cemented pan, or other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost

action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in the tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 16 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 16.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard

Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

Table 17 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 17, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and

swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 17, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in table 17 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 18 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases 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. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous

soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

Table 19 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The months in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 19 indicates, by month, depth to the top (upper limit) and base (lower limit) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and frequency are estimated. *Duration* is expressed as extremely brief if 0.1 hour to 4 hours, very brief if 4 hours to 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. *Frequency* is expressed as none, very rare, rare, occasional, frequent, and very frequent. None means that flooding is not probable; very rare that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); rare that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); occasional that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); frequent that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all

months in any year); and very frequent that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 20 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For *uncoated steel*, the risk of corrosion, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For *concrete*, the risk of corrosion also is expressed as low, moderate, or high. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1999). 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 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve 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 Alfisol.

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 Udalf (Ud, meaning humid, plus alf, from Alfisol).

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; type of saturation; 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 Hapludalfs (Hapl, meaning minimal horizonation, plus udalf, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup 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 taxonomic class.

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 Hapludalfs.

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, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1999) and in "Keys to Soil Taxonomy" (USDA, 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Abreu Family

The Abreu family consists of deep, well drained soils that formed in colluvium derived from andesite and sedimentary rock. The Abreu soils are on mountain slopes. Slope is 35 to 70 percent. Elevation is 7,800 to 8,600 feet. The mean annual precipitation is 18 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Representative pedon of Abreu family very stony

loam in an area of Abreu family-Rubbleland-Rock Outcrop complex, 35 to 80 percent slopes; Rio Arriba County, New Mexico, about 3 miles north of Dulce; located about 1,480 feet west and 1,300 feet south of the northeast corner of Sec. 13, T. 32 N., R 2 W.; Dulce USGS quad; lat. 36 degrees 59 minutes 26 seconds N. and long. 106 degrees 59 minutes 50 seconds W., NAD 27.

A—0 to 6 inches; grayish brown (10YR 5/2) very stony loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, friable, nonsticky and nonplastic; common very fine and fine roots; 10 percent gravel, 20 percent cobble, 25 percent stone; neutral (pH 6.8); clear wavy boundary.

Bt1—6 to 19 inches; yellowish brown (10YR 5/4) very stony clay loam, dark yellowish brown (10YR 4/4) moist; weak, medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; few faint clay films on faces of peds; 10 percent gravel, 20 percent cobble, 25 percent stone; neutral (pH 6.8); clear wavy boundary.

Bt2—19 to 41 inches; yellowish brown (10YR 5/4) very stony clay loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common fine and medium roots; common very fine tubular pores; few faint clay films on faces of peds; 10 percent gravel, 20 percent cobble, 25 percent stone; neutral (pH 6.6); gradual smooth boundary.

C—41 to 80 inches; pale brown (10YR 6/3) very stony sandy clay loam, yellowish brown (10YR 5/4) moist; massive, hard, firm, slightly sticky and slightly plastic; few fine and medium roots; few very fine tubular pores; 10 percent gravel, 20 percent cobble, 25 percent stone; neutral (pH 6.6).

Range in Characteristics

Depth to bedrock: 20 to more than 80 inches
Particle size control section (weighted average):
Clay content: 20 to 35 percent

A, B, and C horizons:
Rock fragments:
Content: 35 to 60 percent
Size: gravel, cobble, and stone
Kind: andesite
Soil reaction: neutral

Archmesa Series

The Archmesa series consists of moderately deep, well drained soils that formed in slope alluvium and residuum derived from andesite. Archmesa soils are on andesite-capped mesas. Slope is 1 to 20 percent. Elevation is 8,200 to 8,600 feet. The mean annual precipitation is 18 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free season is 80 to 100 days.

Typical pedon of Archmesa loam, in an area of Archmesa-Skyute complex, 1 to 25 percent slopes, Archuleta County, Colorado, about 8 miles west of Edith along the Jicarilla Apache Nation boundary; located about 100 feet north and 2,900 feet west of the southeast corner of Sec. 18, T. 32 N., R. 1 W.; Edith USGS quad; lat. 37 degrees 00 minutes 17 seconds N. and long. 106 degrees 59 minutes 36 seconds W., NAD 27.

A1—0 to 3 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; many fine and very fine tubular pores; neutral (pH 6.8); clear smooth boundary.

A2—3 to 10 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure parting to moderate medium granular; soft, friable, slightly sticky and slightly plastic; many fine roots; few fine tubular pores; 2 percent angular gravel; neutral (pH 6.8); clear smooth boundary.

Bt1—10 to 21 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable; moderately sticky and moderately plastic; many fine, few medium roots; few fine tubular pores; common distinct clay films on faces of peds; 5 percent angular gravel; neutral (pH 7.0); clear smooth boundary.

Bt2—21 to 35 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and few medium roots; few fine tubular pores; few distinct clay films on faces of peds; 5 percent gravel and 5 percent flagstone; neutral (pH 6.8); clear wavy boundary.

R—35 inches; andesite bedrock, weathered in the top 2 inches.

Range in Characteristics

Depth to lithic contact: 20 to 40 inches
Thickness of the mollic epipedon: 7 to 16 inches
Particle-size control section (weighted average):
Clay content: 25 to 35 percent
Sand content: 25 to 35 percent
Rock fragments: 0 to 15 percent
Content: 0 to 10 percent
Size: flagstone

Kind: angular andesite
Content: 0 to 10 percent
Size: gravel
Kind: angular andesite

A horizons:
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Clay content: 12 to 22 percent
Rock fragments: 0 to 15 percent

Bt horizons:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: loam, clay loam
Clay content: 25 to 35 percent
Rock fragments: 0 to 15 percent

Argiustolls

The Argiustolls great group consists of variable depth, well drained soils that formed in colluvium derived from sandstone and shale, and are on hillslopes and mountain slopes. Slope is 25 to 70 percent. Elevation is 7,000 to 8,600 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Representative pedon of Argiustolls very stony loam in an area of Haplustalfs-Argiustolls complex, 25 to 70 percent slopes; Rio Arriba County, New Mexico, about 3.5 miles northwest of Dulce; located about 1,100 feet south and 400 feet east of the northwest corner of Sec. 22, T. 32 N., R. 2 W.; Horse Lake USGS quad; lat. 36 degrees 58 minutes 37 seconds N. and long. 107 degrees 02 minutes 17 seconds W., NAD 27.

Oi—0 to 0.5 inch; partially decomposed leaf and needle litter.

A—0.5 to 3 inches; very dark gray (2.5Y 3/1) very stony loam, black (2.5Y 2/1) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 10 percent gravel, 20 percent cobble, 20 percent stone, and 5 percent boulders; neutral (pH 6.8); clear smooth boundary.

AB—3 to 12 inches; dark grayish brown (2.5Y 4/2) very stony clay loam, very dark grayish brown (2.5Y 3/2) moist; common fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; 10 percent gravel, 20 percent cobble, 20 percent stone, and 5 percent boulder; neutral (pH 6.8); clear smooth boundary.

Bt1—12 to 22 inches; light olive brown (2.5Y 5/3) very stony clay loam, olive brown (2.5Y 4/3) moist; moderate very fine angular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine, medium, and coarse roots; common very fine tubular pores; common distinct clay films on faces of peds; 10 percent gravel, 20 percent cobble, and 20 percent stone; neutral (pH 6.6); gradual smooth boundary.

Bt2—22 to 43 inches; light olive brown (2.5Y 5/4) very stony sandy clay loam, olive brown (2.5Y 4/4) moist; weak and moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; few very fine tubular pores; common distinct clay films on faces of peds; 10 percent gravel, 20 percent cobble, 20 percent stone; neutral (pH 6.6); diffuse smooth boundary.

BtC—43 to 80 inches; light yellowish brown (2.5Y 6/3) very stony sandy loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine and medium roots; few fine tubular pores; common faint clay films on faces of peds; 10 percent gravel, 20 percent cobble, 20 percent stone; neutral (pH 6.6).

Range in Characteristics

Depth to bedrock: 20 to more than 60 inches
Particle size control section (weighted average):
Clay content: 20 to 35 percent

A, B, and C horizons:
Rock fragments:
Content: 35 to 60 percent
Size: gravel, cobble, and stone
Kind: sandstone
Soil reaction: neutral

Berryman Series

The Berryman series consists of very deep, well drained soils that formed in alluvium derived from shale and limestone. The Berryman soils are on valleys and hills. Slope is 3 to 8 percent. Elevation is 7,200 to 7,500 feet. The mean annual precipitation is 14 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 115 days.

Typical pedon of Berryman silt loam in an area of Berryman-Ruson association, 1 to 8 percent slopes; Rio Arriba County, New Mexico, about 2.9 miles south and 0.3 miles west of junction of NM Highway 115 and U.S. Highway 84; located about 2,400 feet south and 2,400 feet east of the northwest corner of Sec. 34, T.

26 N., R. 4 E.; Alire USGS quad; lat. 36 degrees 26 minutes 38 seconds N. and long. 106 degrees 30 minutes 02 seconds W., NAD 27.

A—0 to 3 inches; light brownish gray (2.5Y 6/2) silt loam, light olive brown (2.5Y 5/4) moist; weak fine granular structure; soft, very friable, moderately sticky and moderately plastic; common very fine and fine roots; common fine vesicular pores; violently effervescent; moderately alkaline; clear smooth boundary.

Bw—3 to 16 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate fine subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; common fine vesicular pores; violently effervescent; moderately alkaline; clear smooth boundary.

Bk—16 to 80 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few fine tubular pores; violently effervescent; many fine soft masses of calcium carbonate; moderately alkaline.

Range in Characteristics

Calcium carbonate equivalent throughout the profile: 40 to 55 percent

A horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist

Bw horizon:
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist

Bk horizon:
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist

Betonnie Series

The Betonnie series consists of very deep, well drained soils that derived from eolian and alluvial materials derived from sandstone and shale. The Betonnie soils are on plains. Slope is 0 to 8 percent. Elevation is 6,600 to 7,000 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the average frost-free period is 115 to 140 days.

Typical pedon of Betonnie fine sandy loam in an area of Doakum-Betonnie fine sandy loams, 0 to 8 percent slopes; Rio Arriba County, New Mexico, about 2 miles southeast of the old Otero Store site; located about 1,580 feet west and 100 feet south of the northeast corner of Sec. 31, T. 24 N., R. 5 W.; Otero Store quad; lat. 36 degrees 16 minutes 25 seconds N. and long. 107 degrees 17 minutes 30 seconds W., NAD 27.

A—0 to 4 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak medium and coarse platy structure; soft, very friable, nonsticky and nonplastic; common very fine roots; slightly alkaline (pH 7.4); clear smooth boundary.

Bt—4 to 17 inches; brown (7.5YR 5/3) fine sandy loam, brown (7.5YR 4/3) moist; medium coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; common faint clay films on faces of peds and clay bridges between sand grains; slightly alkaline (pH 7.4); clear smooth boundary.

Btk—17 to 38 inches; pale brown (7.5YR 6/3) fine sandy loam, brown (7.5YR 5/3) moist; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; common fine irregular soft masses of carbonate; common faint clay films on faces of peds and bridges between sand grains; strongly effervescent; slightly alkaline (pH 7.6); gradual smooth boundary.

Bk—38 to 50 inches; pale brown (7.5YR 6/3) fine sandy loam, brown (7.5YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; common fine irregular soft masses of carbonate; strongly effervescent; slightly alkaline (pH 7.6); gradual smooth boundary.

C—50 to 80 inches; light yellowish brown (10YR 6/4) stratified fine sandy loam and loamy fine sand, yellowish brown (10YR 5/4) moist; massive, slightly hard, very friable, nonsticky and nonplastic; common very fine tubular pores; slightly effervescent; slightly alkaline (pH 7.6).

Range in Characteristics

A horizon:
Hue: 7.5YR or 10YR
Value: 5 to 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist

Bt or Btk horizons:
Hue: 7.5YR
Value: 4 to 6, dry or moist
Chroma: 3 or 4, dry or moist
Texture: fine sandy loam or sandy loam
Calcium carbonate equivalent: less than 5 percent

C or Bk horizons:
Hue: 7.5YR or 10YR
Value: 4 to 7 dry, 4 to 6 moist

Chroma: 3 to 6, dry or moist
Texture: fine sandy loam or sandy loam
In some pedons, the C horizon contains thin strata of loamy fine sand.
Calcium carbonate equivalent: 1 to 5 percent

Blancot series

The Blancot series consists of very deep, well drained soils that formed in alluvium derived from sandstone and shale and are on valley sides. Slope is 0 to 5 percent. Elevation is 6,600 to 7,000 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Blancot loam in an area of Blancot-Councelor-Tsosie complex, 0 to 5 percent slopes; Rio Arriba County, New Mexico, about 11 miles west of Highway 537 on J6; located about 2,400 feet north and 1,400 feet east of the southwest corner of Sec. 3, T. 25 N., R. 5 W.; Lapis Point USGS quad; lat. 36 degrees 25 minutes 43 seconds N. and long. 107 degrees 21 minutes 05 seconds W., NAD 27.

A—0 to 7 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine platy structure; slightly hard, friable, nonsticky and nonplastic; common very fine roots; slightly alkaline (pH 7.5); clear smooth boundary.

Bt1—7 to 15 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate coarse prismatic structure parting to moderate fine angular blocky; hard, firm, moderately sticky and moderately plastic; many very fine roots; common very fine tubular pores; common faint clay films on faces of peds; slightly alkaline (pH 7.8); clear smooth boundary.

Bt2—15 to 26 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium and fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine roots; common very fine tubular pores; common faint clay films on faces of peds; moderately alkaline (pH 8.1); very slightly effervescent; clear smooth boundary.

C1—26 to 41 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak medium and fine angular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.1); clear smooth boundary.

C2—41 to 80 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; weak fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.1).

Range in Characteristics

A horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist

Bt horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: sandy clay loam or clay loam

C horizons:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: sandy loam, sandy clay loam, clay loam

Some pedons have accumulations of secondary calcium carbonate.

Canyada Series

The Canyada series consists of very deep, well drained soils that formed in stratified alluvium derived from sandstone and shale. The Canyada soils are on stream terraces. Slope is 0 to 3 percent. Elevation is 6,450 to 6,900 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Canyada silty clay in an area of Elias-Canyada-Sparank complex, 0 to 3 percent slopes in Rio Arriba County, New Mexico; located about 2,400 feet west and 1,600 feet south of the northeast corner of Sec. 30, T. 24 N., R. 5 W.; Tafoya Canyon USGS quad; lat. 36 degrees 17 minutes 12 seconds N. and long. 107 degrees 24 minutes 2 seconds W., NAD 27.

A—0 to 1 inch; brown (10YR 5/3) silty clay, dark brown (10YR 4/3) moist; moderately fine granular structure; slightly hard, firm, moderately sticky and moderately plastic; few fine roots; many fine vesicular pores; slightly alkaline (pH 7.5); clear smooth boundary.

Bw—1 to 4 inches; brown (10YR 5/3) clay, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; very hard, very firm, very sticky and very plastic; common fine roots; common fine tubular pores; few fine slickensides; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

C1—4 to 16 inches; brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; massive; very hard, very firm, very sticky and very plastic; few fine and common medium roots; few fine tubular pores; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

2C2—16 to 27 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; hard, very friable, nonsticky and nonplastic; few fine roots; common fine tubular pores; strongly effervescent, with disseminated calcium carbonate; slightly alkaline (pH 7.8), clear smooth boundary.

2C3—27 to 41 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic, few fine roots; few fine tubular pores; strongly effervescent, calcium carbonate segregated in few fine irregularly shaped soft masses, filaments and disseminated throughout matrix; moderately alkaline (pH 7.9); gradual smooth boundary.

2C4—41 to 64 inches; pale brown (10YR 6/3) sand; brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; few fine tubular pores; moderately alkaline (pH 8.0); gradual smooth boundary.

2C5—64 to 80 inches; very pale brown (10YR 7/3) fine sand; brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; moderately alkaline (pH 8.0).

Range in Characteristics

Depth to contrasting layer: 10 to 20 inches
Soil reaction: slightly alkaline to strongly alkaline
Calcium carbonate equivalent: less than 15 percent
EC (mmhos/cm): 0 to 2
SAR: 0 to 10

A horizon:
Hue: 10YR or 7.5YR
Value: 5 or 6, dry or moist
Chroma: 3 or 4, dry or moist

Bw horizon:
Hue: 10YR or 7.5YR
Value: 4 to 6, dry or moist
Chroma: 3 or 4, dry or moist
Texture: clay, silty clay, or clay loam (38 to 58 percent clay)

C horizons:
Hue: 10YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: clay, silty clay, or clay loam (38 to 58 percent clay)

2C horizons:
Hue: 10YR or 7.5YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: ranges from fine sandy loam to sand (5 to 15 percent clay)

Cedarsprings Series

The Cedarsprings series consists of very deep, well drained soils that formed in alluvium derived from sandstone and shale. Cedarsprings soils are in valleys and drainageways. Slope is 1 to 10 percent. Elevation is 7,300 to 7,800 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free season is 80 to 100 days.

Typical pedon of Cedarsprings loam, in an area of Jaythree-Cedarsprings complex, 3 to 15 percent slopes; Rio Arriba County, New Mexico; about 3.5 miles west of Stone Lake; located about 1,700 feet north and 400 feet west of the southeast corner of Sec. 16, T. 29 N., R. 1 W.; Cedar Canyon USGS quad; lat. 36 degrees 43 minutes 22 seconds N. and long. 106 degrees 56 minutes 50 seconds W., NAD 27.

Oi—0 to 0.5 inch; slightly decomposed needle litter.

A—0.5 to 3 inches; dark gray (2.5Y 4/1) loam, black (2.5Y 2.5/1) moist; weak, fine granular structure; soft, friable, nonsticky and nonplastic; common very fine roots; neutral (pH 6.8); clear smooth boundary.

AB—3 to 9 inches; dark gray (2.5Y 4/1) loam, black (2.5Y 2.5/1) moist; weak medium and fine angular blocky structure; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common very fine tubular pores; neutral (pH 6.8); clear smooth boundary.

Bt1—9 to 19 inches; very dark gray (2.5Y 3/1) clay loam, black (2.5Y 2.5/1) moist; strong medium and fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine roots; common very fine tubular pores; common distinct clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

Bt2—19 to 42 inches; light olive brown (2.5Y 5/3) clay, olive brown (2.5Y 4/3) moist; strong medium prismatic structure parting to strong medium angular blocky; hard, firm, moderately sticky and moderately plastic; common very fine roots; common very fine tubular pores; many distinct clay films on faces of peds; few distinct organic matter stains on faces of peds; few distinct slickensides; neutral (pH 6.8); clear smooth boundary.

Bt3—42 to 55 inches; light yellowish brown (2.5Y 6/4) sandy clay loam, light olive brown (2.5Y 5/4)

moist; weak and moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; few faint clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

Bt4—55 to 80 inches; light yellowish brown (2.5Y 6/4) sandy clay loam, light olive brown (2.5Y 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; few faint clay films on faces of peds; neutral (pH 7.2).

Range in Characteristics

Thickness of the mollic epipedon: 16 to 34 inches
Vertic features: slickensides in a subhorizon of the argillic
Particle-size control section (weighted average):
Clay content: 35 to 50 percent
Sand content: 30 to 50 percent
Rock fragments: 0 to 5 percent
Content: 0 to 5 percent
Size: gravel
Kind: subangular sandstone

A horizon:
Hue: 10YR or 2.5Y
Value: 2 or 3 moist, 3 to 5 dry
Chroma: 1 or 2, dry or moist
Clay content: 18 to 30 percent
Soil reaction: neutral to slightly acid

AB horizon:
Hue: 10YR or 2.5Y
Value: 2 or 3 moist, 3 to 5 dry
Chroma: 1 or 2, dry or moist
Texture: loam or clay loam
Clay content: 20 to 35 percent
Soil reaction: neutral to slightly acid

Bt horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 1 to 4, dry or moist
Texture: sandy clay loam, clay loam, or clay
Clay content: 35 to 50 percent
Rock fragments: 0 to 5 percent
Soil reaction: neutral to slightly acid

Cementlake Series

The Cementlake series consists of very deep, well drained, very slowly permeable soils that formed in alluvial sediments derived from shale and sandstone on valley sideslopes and low stream terraces. Slope is 1 to 6 percent. Elevation is 6,900 to 7,400 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Cementlake sandy loam in an area of Orlie-Cementlake complex, 1 to 6 percent slopes; Rio Arriba County, New Mexico; about 4 miles southeast of Cement Lake; located about 2,100 feet south and 1,500 feet west of the northeast corner of Sec. 36, T. 28 N., R. 2 W.; Losindios USGS quad; lat. 36 degrees 35 minutes 45 seconds N. and long. 106 degrees 59 minutes 27 seconds W., NAD 27.

E—0 to 1 inch; very pale brown (10YR 7/3) sandy loam, yellowish brown (10YR 5/4) moist; weak very fine platy structure; hard, friable, nonsticky and nonplastic; many very fine vesicular pores; 5 percent pebbles; slightly alkaline (pH 7.6); abrupt smooth boundary.

Btn1—1 to 8 inches; yellowish brown (10YR 5/4) sandy clay, dark yellowish brown (10YR 4/4) moist; moderate coarse columnar structure parting to strong fine angular blocky; hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; many faint clay films on faces of peds; 5 percent pebbles; very slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Btn2—8 to 17 inches; brown (10YR 5/3) sandy clay, brown (10YR 4/3) moist; moderate fine angular blocky structure; very hard, very firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; common faint clay films on faces of peds; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Btknz—17 to 32 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; weak medium and fine angular blocky structure; very hard, friable moderately sticky and moderately plastic; few very fine roots; common very fine tubular pores; few faint clay films on faces of peds; violently effervescent; calcium carbonate and salts occur as common fine irregular soft seams and filaments; strongly alkaline (pH 8.6); gradual smooth boundary.

Bknz—32 to 80 inches; grayish brown (10YR 5/2) stratified sandy clay loam and sandy clay, dark grayish brown (10YR 4/2) moist; weak fine angular blocky structure; hard, friable, moderately sticky and moderately plastic; very few very fine roots; common very fine tubular pores; slightly effervescent; calcium carbonate, gypsum, and salt occur as few fine irregular soft filaments; moderately alkaline (pH 8.4).

Range in Characteristics

E horizon:
Value: 6 or 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist

Btn horizons:
Hue: 10YR or 7.5YR
Value: 4 or 5 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: clay, clay loam, or sandy clay
Coarse fragments: 0 to 10 percent pebbles
EC (mmhos/cm): 0 to 4
SAR: 13 to 45

Btknz or Bknz horizons:
Hue: 10YR or 7.5YR
Value: 5 or 6 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: ranges from clay through sandy clay loam
Coarse fragments: 0 to 10 percent pebbles
EC (mmhos/cm): 0 to 8
SAR: 13 to 45
Calcium carbonate equivalent: less than 15 percent

C horizon (where present):
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 or 3, dry or moist
Texture: clay, silt loam, or loam

Depth to secondary calcium carbonate is 8 to 26 inches.

Councelor Series

The Councelor series consists of very deep, well drained, moderately rapidly permeable soils that formed in alluvium and eolian sediments derived from sandstone and shale on fans and valleys. Slope is 0 to 15 percent. Elevation is 6,450 to 7,000 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Councelor fine sandy loam in an area of Blancot-Councelor-Tsosie complex, 0 to 5 percent slopes; Rio Arriba County, New Mexico; located about 2,500 feet west and 150 feet north of the southeast corner of Sec. 17, T. 24 N., R. 4 W.; Otero Store USGS quad; lat. 36 degrees 18 minutes 13 seconds N. and long. 107 degrees 16 minutes 36 seconds W., NAD 27.

A—0 to 2 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; neutral (pH 6.7); clear smooth boundary.

C1—2 to 16 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few coarse roots; few fine tubular pores; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

C2—16 to 27 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; slightly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

C3—27 to 32 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; few fine tubular pores; strongly effervescent; strongly alkaline (pH 9.0); clear smooth boundary.

C4—32 to 60 inches; brown (10YR 5/3) stratified loamy fine sand, brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine and fine roots; few fine tubular pores; slightly effervescent; strongly alkaline (pH 9.3); sandy loam and silt stratification 1 to 2 cm thick; clear smooth boundary.

C5—60 to 80 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine tubular pores; slightly effervescent; strongly alkaline (pH 9.0); clear smooth boundary.

Range in Characteristics

Calcium carbonate: 1 to 15 percent
Particle-size control section (weighted average):
Clay content: 8 to 18 percent
Rock fragments: 0 to 5 percent, dominantly pebbles

A horizon:
Hue: 10YR or 7.5YR
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist

C horizons:
Hue: 10YR or 7.5YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: sandy clay loam, fine sandy loam, sandy loam, loamy fine sand

In some pedons, the C horizon contains thin strata of loamy sand, loamy fine sand, and sandy clay loam.

Doakum Series

The Doakum series consists of very deep, well-drained soils that formed in eolian and alluvial materials derived from sandstone and shale. Doakum soils are on plains. Slope is 1 to 8 percent. Elevation is 6,500 to 7,100 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Doakum in an area of Doakum very fine sandy loam, 1 to 6 percent slopes, Rio Arriba County, New Mexico; located about 1,000 feet west and 300 feet north of the southeast corner of Sec. 23, T. 24 N., R. 5 W.; Otero Store USGS quad; lat. 36 degrees 17 minutes 26 seconds N. and long. 107 degrees 19 minutes 29 seconds W., NAD 27.

A—0 to 4 inches; light brown (7.5YR 6/4) very fine sandy loam, dark brown (7.5YR 3/4) moist; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and medium roots; many very fine and fine vesicular pores; neutral (pH 7.0); abrupt smooth boundary.

Bt—4 to 12 inches; brown (7.5YR 4/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; strong medium prismatic structure parting to strong medium subangular blocky; hard, friable, moderately sticky and moderately plastic; common very fine and medium roots; few very fine and coarse tubular pores; common faint clay films on faces of peds and in pores; neutral (pH 7.3); clear smooth boundary.

Btk—12 to 18 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; few very fine and few medium roots; common very fine and fine and few coarse tubular pores; few faint clay films on faces of peds and in pores; strongly effervescent; strongly alkaline (pH 8.7); clear smooth boundary.

Bk1—18 to 36 inches; brown (7.5YR 5/4) very fine sandy loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; few very fine and coarse tubular pores; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary.

Bk2—36 to 53 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine and coarse tubular pores; strongly effervescent; moderately alkaline (pH 8.1); clear smooth boundary.

C—53 to 80 inches; brown (7.5YR 5/4) very fine sandy loam; brown (7.5YR 5/4) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; few very fine roots; few very fine and coarse tubular pores; strongly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

Range in Characteristics

A horizon:
Hue: 10YR or 7.5YR
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist

Bt horizon:
Hue: 5YR or 7.5YR
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 3 to 6 dry, 3 or 4 moist
Texture: clay loam, sandy clay loam

Btk or Bk horizons:
Hue: 10YR or 7.5YR
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 3 to 5 dry, 3 or 4 moist
Texture: sandy clay loam, very fine sandy loam, fine sandy loam
Calcium carbonate equivalent: less than 15 percent

C horizon (where present):
Hue: 10YR or 7.5YR
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: loam, very fine sandy loam, fine sandy loam, loamy fine sand

Dula Series

The Dula series consists of very deep, poorly drained soils that formed in alluvium derived from mixed sources and are on flood plains. Slope is 0 to 2 percent. Elevation is 6,450 to 6,900 feet. The mean annual precipitation is 18 to 20 inches. The mean annual air temperature is 40 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Dula loam, 0 to 2 percent slopes, in an area of Dula loam, 0 to 2 percent slopes; Rio Arriba County, New Mexico; within the village limits of Chama; in an unsurveyed area; Chama USGS quad; lat. 36 degrees 53 minutes 30 seconds N. and long. 106 degrees 34 minutes 43 seconds W., NAD 27.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; strong medium granular structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; common fine interstitial pores; neutral; abrupt smooth boundary.

A2—4 to 11 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; few fine faint yellowish brown (10YR 5/4) redox concentrations; moderate coarse granular structure; slightly hard, friable, moderately sticky and moderately plastic; many fine and common very fine roots; common fine tubular pores; neutral; clear smooth boundary.

Bg1—11 to 18 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; few fine distinct yellowish brown (10YR 5/8) redox concentrations; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; few fine tubular pores; neutral; clear smooth boundary.

Bg2—18 to 28 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; many medium distinct reddish yellow (7.5YR 6/8) redox concentrations; massive; slightly hard, friable, moderately sticky and moderately plastic; few fine roots; few fine tubular pores; neutral; clear smooth boundary.

2C—28 to 80 inches; variegated extremely gravelly coarse sand; single grain; loose, nonsticky and nonplastic; few fine roots; 60 percent pebbles and 10 percent cobble; neutral.

Range in Characteristics

Depth to endosaturation: 12 to 36 inches

A horizons:
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist

Bg horizons:
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 1 to 3, dry or moist

Clay content ranges from 18 to 25 percent.

2C horizon:
Rock fragments: 40 to 60 percent pebbles and 10 to 25 percent cobble

Dulcepeak Series

The Dulcepeak series consists of moderately deep, well drained soils that formed in slope alluvium and residuum derived from sandstone and shale. Dulcepeak soils are on mesas, cuestas, and hills. Slope is 1 to 25 percent. Elevation is 6,900 to 8,800 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Dulcepeak very cobbly loam, in an area of Herm-Dulcepeak complex, 3 to 25 percent slopes, Rio Arriba County, New Mexico; about 4 miles southeast of the town of Dulce; located about 1,850 feet south and 1,500 feet east of the northwest corner of Sec. 26, T. 31 N., R. 1 W.; Cordova USGS quad; lat. 36 degrees 52 minutes 25 seconds N. and long. 106 degrees 54 minutes 05 seconds W., NAD 27.

A—0 to 5 inches; dark gray (7.5YR 4/1) very cobbly loam, black (7.5YR 2.5/1) moist; weak fine granular structure; soft very friable, nonsticky and nonplastic, many very fine roots; 20 percent subangular sandstone gravel, 20 percent angular sandstone cobble, and 1 percent stone; neutral (pH 7.0); abrupt smooth boundary.

Bt1—5 to 13 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; strong fine angular block structure; hard, firm, moderately sticky and moderately plastic; common very fine, fine, and medium roots; few very fine tubular pores; many prominent clay films on faces of peds; 10 percent angular sandstone cobble; neutral (pH 6.8); clear smooth boundary.

Bt2—13 to 20 inches; strong brown (7.5YR 5/6) clay, strong brown (7.5YR 4/6) moist; moderate medium and fine angular blocky structure; very hard, very firm, moderately sticky and moderately plastic; common medium and coarse roots; few very fine tubular pores; many prominent clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

Bt3—20 to 26 inches; brown (7.5YR 5/4) gravelly clay loam, strong brown (7.5YR 4/6) moist; moderate medium angular blocky structure; very hard, firm, moderately sticky and moderately plastic; few medium and coarse roots; few very fine tubular pores; common distinct clay films on faces of peds; 16 percent subangular sandstone gravel; neutral (pH 6.8); clear smooth boundary.

R—26 inches; hard sandstone bedrock.

Range in Characteristics

Depth to argillic horizon: 2 to 16 inches
Depth to lithic contact: 20 to 40 inches
Particle-size control section (weighted average):
Clay content: 35 to 50 percent
Sand content: 20 to 50 percent
Rock fragments: 5 to 35 percent
Content: 0 to 25 percent
Size: gravel
Kind: angular sandstone
Content: 0 to 25 percent
Size: cobble
Kind: angular sandstone
Content: 0 to 25 percent
Size: stone
Kind: angular sandstone

A horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 2 to 4 moist

Chroma: 1 to 3, dry or moist
Clay content: 12 to 22 percent
Rock fragments: 15 to 35
Content: 0 to 25 percent
Size: gravel
Kind: angular sandstone
Content: 0 to 25 percent
Size: cobble
Kind: angular sandstone
Content: 0 to 25 percent
Size: stone
Kind: angular sandstone

Bt horizons:
Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 4 to 6, dry or moist
Texture, fine earth fraction: clay loam, clay, sandy clay
Clay content: 35 to 55 percent
Rock fragments: 0 to 35 percent
Size: gravel

Elias Series

The Elias series consists of very deep, well drained, slowly permeable soils that formed in alluvial sediments derived from shale and sandstone. The Elias soils are on stream terraces. Slope is 0 to 3 percent. Elevation is 6,450 to 6,900 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Elias; in an area of Elias-Canyada-Sparank complex, saline-sodic, 0 to 3 percent slopes; Rio Arriba County, New Mexico; located abut 1,500 feet east and 900 feet south of the northwest corner of Sec. 30, T. 24 N., R. 5 W.; Tafoya Canyon USGS quad; lat. 36 degrees 17 minutes 18 seconds N. and long. 107 degrees 24 minutes 21 seconds W., NAD 27.

E—0 to 1 inch; very pale brown (10YR 7/3) fine sandy loam, pale brown (10YR 6/3) moist; weak fine platy structure; slightly hard, friable, nonsticky and nonplastic; many very fine tubular pores; slightly alkaline (pH 7.7); clear smooth boundary.

Btn—1 to 10 inches; grayish brown (7.5YR 5/2) clay loam, dark grayish brown (7.5YR 4/2) moist; weak medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and common medium roots; common very fine tubular pores; common distinct clay films on faces of peds; very strongly alkaline (pH 9.0); clear smooth boundary.

Bkn1—10 to 13 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; slightly effervescent; very strongly alkaline (pH 9.5); clear wavy boundary.

Bkn2—13 to 36 inches; light yellowish brown (10YR 6/4) very fine sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.6); abrupt wavy boundary.

Bkn3—36 to 80 inches; light yellowish brown (10YR 6/4) stratified fine sandy loam and loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.7); abrupt wavy boundary.

Range in Characteristics

E horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Coarse fragments: 0 to 10 percent pebbles

Btn horizon:
Value: 4 or 6 dry, 3 to 5 moist
Chroma: 3 to 4, dry or moist
Texture: clay loam or sandy clay loam
Calcium carbonate equivalent: less than 10 percent
SAR: 13 to 30
Coarse fragments: 0 to 10 percent pebbles

Bkn horizons:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: fine sandy loam, very fine sandy loam, loam
Calcium carbonate equivalent: less than 15 percent
Coarse fragments: 0 to 10 percent pebbles
Gypsum in this horizon is estimated to be between 2 and 10 percent.
Depth to secondary calcium carbonate is 5 to 15 inches.

Elpedro Series

The Elpedro series consists of very deep, well drained soils on mesas, benches, valley sides, and hills. Slope is 1 to 5 percent. Elevation is 6,500 to 7,400 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Elpedro, in an area of Elpedro silt loam, 1 to 5 percent slopes; Rio Arriba County, New Mexico; in an unsurveyed area 2.5 miles west of Hwy.

84 and 2.7 miles south of the Spills Ranch Headquarters; Las Nutrias USGS quad; lat. 106 degrees 33 minutes 44 seconds N. and long. 36 degrees 34 minutes and 44 seconds W., NAD 27.

A—0 to 3 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and moderately plastic; few fine and medium roots; few fine tubular pores; violently effervescent; moderately alkaline; abrupt smooth boundary.

Bt—3 to 16 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, very friable, sticky and slightly plastic; common very fine and few fine roots; many fine and few very fine tubular pores; few faint clay films on faces of peds; violently effervescent; moderately alkaline; clear smooth boundary.

Btk—16 to 34 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; hard, very friable, sticky and slightly plastic; common very fine and few fine roots; many fine and few very fine tubular pores; few faint clay films on faces of peds; strongly effervescent; few fine seams of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk1—34 to 47 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; massive; hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine tubular pores; strongly effervescent; few fine seams and threads of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk2—47 to 80 inches; light yellowish brown (10YR 6/4) silty clay loam, yellowish brown (10YR 5/4) moist; massive; hard, very friable, sticky and slightly plastic; strongly effervescent; moderately alkaline.

Range in Characteristics

Reaction is slightly or moderately alkaline.

A horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist

Bt horizons:
Hue: 5YR or 7.5YR
Value: 3 to 5 dry, 4 to 5 moist
Chroma: 3 to 5, dry or moist
Texture: silty clay loam and silt loam averaging 27 to 35 percent clay

Bk horizons (where present):
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: loam, silt loam, or silty clay loam

Escrito Series

The Escrito series consists of shallow, well drained soils that formed in residuum from sandstone and are on hillslopes and mountain slopes. Slope is 5 to 60 percent. Elevation is 7,200 to 8,600 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Escrito very fine sandy loam in an area of Escrito-Rock Outcrop-Dulcepeak complex, 1 to 15 percent slopes; Rio Arriba County, New Mexico, located about one mile east of Tecolote Gap, 1,500 feet west and 400 feet north of the southeast corner of Sec. 27, T. 30 N., R. 2 E.; Sawmill Mesa USGS quad; lat. 36 degrees, 46 minutes, 40 seconds N. and long. 106 degrees, 42 minutes, 35 seconds W., NAD 27.

Oi—0 to 0.25 inch; slightly decomposed forest litter.

A1—0.25 to 1 inch; brown (10YR 5/3) very fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium platy structure parting to weak very fine granular; soft, very friable, slightly sticky and slightly plastic; common very fine roots; few very fine vesicular pores; 5 percent cobble; strongly acid (pH 5.3); clear smooth boundary.

A2—1 to 6 inches; yellowish brown (10YR 5/4) very fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine, few medium roots; common very fine and fine tubular pores; moderately acid (pH 5.8); clear smooth boundary.

Bw—6 to 16 inches; light brown (7.5YR 6/4) loam, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine, common fine medium and coarse roots; common fine tubular pores; moderately acid (pH 5.7); clear wavy boundary.

R—16 inches; sandstone bedrock.

Range in Characteristics

Depth to lithic contact: 10 to 20 inches to hard sandstone
Depth to cambic horizon: 1 to 7 inches
Particle-size control section (weighted average):
Clay content: 10 to 18 percent
Sand content: 40 to 80 percent
Rock fragments: 0 to 30 percent
Content: 0 to 15 percent
Size: gravel
Kind: subangular sandstone

Content: 0 to 15 percent
Size: cobble
Kind: angular to subrounded sandstone
Content: 0 to 15 percent
Size: stone
Kind: angular to subrounded sandstone
Content: 0 to 15 percent

A horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 4 moist
Chroma: 2 to 4, dry or moist
Rock fragments: 0 to 35
Reaction: neutral to slightly acid

Bw horizon:
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: sandy loam, fine sandy loam, or loam
Clay content: 10 to 18 percent
Rock fragments: 0 to 15 percent
Reaction: neutral to slightly acid

Eslendo Series

The Eslendo series consists of shallow and very shallow, well drained soils derived from shale alluvium and residuum on hillslopes and mesas. Slope is 5 to 20 percent. Elevation is 6,450 to 7,000 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free season is 115 to 140 days.

Typical pedon of Eslendo silty clay loam, in an area of Skyvillage-Eslendo complex 3 to 35 percent slopes; Rio Arriba County, New Mexico; about 6 miles northeast of Councelor; located about 1,500 feet west and 1,400 feet south of the northeast corner of Sec. 16, T. 23 N., R. 5 W.; Tancosa Windmill USGS quad; lat. 36 degrees 13 minutes 42 seconds N. and long. 107 degrees 21 minutes 46 seconds W., NAD 27.

A—0 to 2 inches; light gray (2.5Y 7/1) silty clay loam, light brownish gray (2.5Y 6/2) moist; weak fine granular structure; loose, very firm, very sticky and very plastic; many very fine and fine roots; slightly effervescent; slightly alkaline (pH 7.8) clear smooth boundary.

C—2 to 13 inches; light gray (2.5Y 7/1) silty clay loam, light brownish gray (2.5Y 6/2) moist; massive structure; very hard, very firm, very sticky and very plastic; common very fine and fine, and few medium roots; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

Cr—13 to 39 inches; soft calcareous shale.

Range in Characteristics

Depth to paralithic contact: 6 to 13 inches
Rock fragments:
Content: 0 to 15 percent
Size: gravel and cobble
Kind: subangular sandstone

A and C horizons:
Hue: 10YR or 2.5Y
Value: 5 to 7, dry or moist
Chroma: 1 to 4, dry or moist
Texture: silty clay loam, clay loam, loam

Florita Series

The Florita series consists of very deep, well drained soils in alluvium derived from sandstone and are on low hills and valley sides. Slope is 2 to 10 percent. Elevation is 6,450 to 6,900 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Florita fine sandy loam in an area of Pinavetes-Florita complex, 2 to 10 percent slopes; Sandoval County, New Mexico, about 4 miles east of Councelor and 1.25 miles north of Highway 44; located about 1,500 feet north and 700 feet west of the southeast corner of Sec. 20, T. 23 N., R. 5 W.; Councelor USGS quad; lat. 36 degrees 12 minutes 25 seconds N. and long. 107 degrees 22 minutes 35 seconds W., NAD 27.

A—0 to 3 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; neutral (pH 6.8); clear smooth boundary.

C1—3 to 18 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine roots; few very fine tubular pores; neutral (pH 6.8); clear smooth boundary.

C2—18 to 31 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; common very fine roots; few very fine tubular pores; neutral (pH 7.0); clear smooth boundary.

C3—31 to 41 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, friable, nonsticky and nonplastic; few very fine roots; neutral (pH 7.0); clear smooth boundary.

C4—41 to 80 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly

hard, friable, nonsticky and nonplastic; few very fine tubular pores; very slightly effervescent; slightly alkaline (pH 7.4).

Range in Characteristics

A horizon:
Value: 3 to 5, dry or moist
Chroma: 2 to 4, dry or moist
Rock fragments: 0 to 5 percent pebbles on the surface

C horizons:
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 or 4, dry or moist
Texture: sandy loam and fine sandy loam. This horizon is often stratified with lenses of loam or loamy fine sand.

Gojiya Series

The Gojiya series consists of very deep, somewhat poorly drained soils that formed in alluvium derived from sandstone and shale. Gojiya soils are in drainageways, stream terraces, and lake plains. Slope is 0 to 3 percent. Elevation is 6,900 to 7,300 feet. The mean annual precipitation is 14 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Gojiya silty clay, 0 to 3 percent slopes, Rio Arriba County, New Mexico; about 1,000 feet north of Stone Lake; located about 1,200 feet south and 880 feet east of the northwest corner of Sec. 18, T. 29 N., R. 1 E.; Apache Mesa USGS quad; lat. 36 degrees 44 minutes 45 seconds N. and long. 106 degrees 52 minutes 28 seconds W., NAD 27.

A—0 to 2 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak very fine granular structure; slightly hard, firm, moderately sticky and moderately plastic; common very fine roots; slightly effervescent; nonsaline (E.C. 0.7 mmhos/cm); slightly alkaline (pH 7.8); clear smooth boundary.

Bw1—2 to 9 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine roots; few very fine tubular pores; common very fine filaments of salt; very slightly saline (E.C. 3.5 mmhos/cm); slightly effervescent; few fine faint redox concentrations, light olive brown (2.5Y 5/6) moist; moderately alkaline (pH 8.0); clear smooth boundary.

Bw2—9 to 16 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; moderate fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; few fine distinct pressure faces; few very fine filaments of salt; very slightly saline; (E.C. 2.8 mmhos/cm); slightly effervescent; few fine faint redox concentrations, light olive brown (2.5Y 5/6) moist; moderately alkaline (pH 8.0); clear smooth boundary.

Cz1—16 to 50 inches; grayish brown (2.5Y 5/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak fine angular blocky structure; very hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; few fine distinct pressure faces; common medium seams and filaments of gypsum and salts more soluble than gypsum; moderately saline (E.C. 9.5 mmhos/cm); slightly effervescent; few fine faint redox concentrations, light olive brown (2.5Y 5/6) moist; moderately alkaline (pH 8.0); clear smooth boundary.

Cz2—50 to 70 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; few fine filaments and seams of gypsum and salts more soluble than gypsum; slightly saline (E.C. 7.9 mmhos/cm); very slightly effervescent; common fine faint redox concentrations, light olive brown (2.5Y 5/6) moist; moderately alkaline (pH 8.0); clear smooth boundary.

Cz3—70 to 80 inches; gray (2.5Y 6/1) silty clay loam, gray (2.5Y 5/1) moist; massive; very hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; few fine filaments of gypsum and salts more soluble than gypsum (E.C. 3.7 mmhos/cm); very slightly effervescent; few fine faint redox concentrations, light olive brown (2.5Y 5/6) moist; moderately alkaline (pH 8.0); clear smooth boundary.

Range in Characteristics

Depth to endosaturation: 50 to 80 inches
Vertic features: cracking throughout a depth of 0-12 inches in normal years, COLE of 0.06 to 0.09 in the upper 40 inches.
Particle-size control section (weighted average):
Clay content: 45 to 60 percent
Sand content: 10 to 40 percent

A horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 1 to 3, dry or moist
Texture: silty clay or clay

Clay content: 40 to 50 percent
Calcium carbonate equivalent: 0 to 5 percent
EC (mmhos/cm): 0 to 4
SAR: 0 to 5

Bw horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 1 to 2, dry or moist
Texture: silty clay or clay
Clay content: 40 to 60 percent
Calcium carbonate equivalent: 0 to 5 percent
EC (mmhos/cm): 2 to 4
Gypsum: 1 to 5 percent
SAR: 0 to 10
Soil reaction: slightly to moderately alkaline

Cz horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 1 to 2, dry or moist
Texture: silty clay loam, silty clay, or clay
Clay content: 28 to 60 percent
Calcium carbonate equivalent: 0 to 15 percent
EC (mmhos/cm): 2 to 10
Gypsum: 1 to 5 percent
SAR: 0 to 10
Soil reaction: slightly to moderately alkaline

Haplustalfs

The Haplustalfs soils are variable depth, well drained soils that formed in colluvium derived from sandstone and shale and are on mountain slopes and hillslopes. Slope is 25 to 70 percent. Elevation is 7,000 to 8,600 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Representative profile of Haplustalfs very stony sandy loam in an area of Haplustalfs-Argiustolls complex, 25 to 70 percent slopes; Rio Arriba County, New Mexico about 3.5 miles northwest of Dulce; located about 600 feet north and 600 feet east of the southwest corner of Sec. 15, T. 32 N., R. 2 W.; Wirt Canyon USGS quad; lat. 36 degrees 58 minutes 57 seconds N. and long. 107 degrees 02 minutes 15 seconds W., NAD 27.

Oi—0 to 1 inch; partially decomposed needle and leaf litter.

A—1 to 5 inches; grayish brown (10YR 5/2) very stony sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; 10 percent gravel, 10 percent cobble, 25 percent stone, 5 percent boulders; neutral (pH 7.0); clear smooth boundary.

Bt1—5 to 11 inches; yellowish brown (10YR 5/4) very stony sandy clay loam, dark yellowish brown (10YR 4/4) moist; strong very fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; many fine medium and coarse roots; many distinct clay films on faces of peds; 10 percent gravel, 10 percent cobble, 25 percent stone, 5 percent boulder; neutral (pH 6.8); clear smooth boundary.

Bt2—11 to 31 inches; light yellowish brown (10YR 6/4) very stony sandy clay loam, dark yellowish brown (10YR 4/6) moist; moderate medium and fine angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine medium and coarse roots; few fine tubular pores; many distinct clay films on faces of peds; 10 percent gravel, 10 percent cobble, 25 percent stone, 5 percent boulder; neutral (pH 6.6); gradual smooth boundary.

Bt3—31 to 60 inches; brown (10YR 5/3) very stony sandy clay loam, brown (10YR 4/3) moist; weak and moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine medium and coarse roots; few very fine tubular pores; common distinct clay films on faces of peds; 10 percent gravel, 10 percent cobble, 25 percent stone, 5 percent boulder; neutral (pH 7.0); diffuse wavy boundary.

BtC—60 to 80 inches; brown (10YR 5/3) very stony sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few fine medium and coarse roots; few very fine tubular pores; few distinct clay films on faces of peds; 10 percent gravel, 10 percent cobble, 25 percent stone, 5 percent boulders; neutral (pH 7.2).

Range in Characteristics

Depth to bedrock: 20 to more than 60 inches
Particle size control section (weighted average):
Clay content: 20 to 45 percent

A, B, and C horizons:
Rock fragments:
Content: 35 to 60 percent
Size: gravel, cobble, and stone
Kind: sandstone
Soil reaction: neutral to slightly alkaline

Haplustepts

Haplustepts consists of variable depth, well drained soils that formed in colluvium primarily from sandstone

and are on canyon slopes and escarpments. Slope is 35 to 75 percent. Elevation is 7,300 to 8,600 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Representative pedon of Haplustepts in an area of Haplustepts-Haplustalfs complex, 35 to 75 percent slopes; Rio Arriba County, New Mexico, about 2 miles northeast of Horse Lake; in an unsurveyed area, approximately northeast Sec. 13, T. 30 N., R. 1 E.; Horse Lake USGS quad; lat. 36 degrees 50 minutes 02 seconds N. and long. 106 degrees 47 minutes 53 seconds W., NAD 27.

Oi—0 to 1 inch; needle litter.

A—1 to 5 inches; grayish brown (10YR 5/2) very stony loam, dark brown (10YR 3/3) moist; weak, fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; 10 percent gravel, 15 percent cobble, 15 percent stone, 10 percent boulder; neutral (pH 6.8), clear smooth boundary.

AB—5 to 13 inches; light brownish gray (10YR 6/2) very stony loam, dark grayish brown (10YR 4/2) moist; weak medium granular structure; soft, friable, nonsticky and nonplastic; common fine and medium roots; 10 percent gravel, 15 percent cobble, 15 percent stone, 5 percent boulder; neutral (pH 6.8); gradual wavy boundary.

Bw1—13 to 30 inches; pale brown (10YR 6/3) very stony loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; 10 percent gravel, 15 percent cobble, 15 percent stone, 5 percent boulder; neutral (pH 6.7); gradual wavy boundary.

Bw2—30 to 43 inches; pale brown (10YR 6/3) very stony loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine and medium roots; 10 percent gravel, 15 percent cobble, 15 percent stone, 5 percent boulder; neutral (pH 6.7); clear smooth boundary.

R—43 inches; sandstone bedrock.

Range in Characteristics

Depth to bedrock: 20 to more than 60 inches
Particle size control section (weighted average):
Clay content: 18 to 27 percent

A, B, and C horizons:
Rock fragments:
Content: 35 to 60 percent
Size: gravel, cobble, and stone
Kind: sandstone
Soil reaction: neutral

Herm Series

The Herm series consists of very deep, well drained soils that formed in slope alluvium derived from shale and sandstone. The Herm soils are on hills, cuestas, and mesas. Slope is 0 to 10 percent. Elevation is 7,200 to 8,800 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Herm loam in an area of Herm-Dulcepeak complex, 3 to 25 percent slopes; Rio Arriba County, New Mexico, 5.4 miles south of Monero; in an unsurveyed area; Horse Lake USGS quad; lat. 36 degrees 50 minutes 23 seconds N. and long. 106 degrees 47 minutes 48 seconds W., NAD 27.

A—0 to 4 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and moderately plastic; common very fine and fine roots; common very fine tubular pores; neutral; clear smooth boundary.

BA—4 to 11 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable; moderately sticky and moderately plastic; few very fine and fine roots; few very fine tubular pores; neutral; clear smooth boundary.

Bt1—11 to 16 inches; yellowish brown (10YR 5/4) clay, dark brown (10YR 3/3) moist; moderate fine subangular structure; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few very fine vesicular pores; few faint clay films on faces of peds; neutral; clear smooth boundary.

Bt2—16 to 19 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few very fine tubular pores; common distinct clay films on faces of peds; neutral; clear smooth boundary.

Bt3—19 to 24 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few very fine tubular pores; few distinct clay films on faces of peds; neutral; gradual smooth boundary.

C—24 to 80 inches; brownish yellow (10YR 6/6) clay

loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, moderately sticky and moderately plastic; slightly alkaline.

Range in Characteristics

Depth to secondary calcium carbonate: 40 to more than 60 inches
Weathered bedrock occurs at 60 to 80 inches in some pedons.

A horizon:
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist

BA horizon:
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: silt loam or loam

Bt horizons:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: clay, silty clay loam, clay loam

C horizon (where present):
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 to 6, dry or moist
Texture: clay or clay loam

Hetz Series

The Hetz series consists of very deep, somewhat poorly, and poorly drained soils that formed in alluvium derived from sandstone and shale. Hetz soils are in wet drainageways and valley bottoms. Slope is 0 to 3 percent. Elevation is 6,900 to 7,100 feet. The mean annual precipitation is 14 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Hetz clay loam, 0 to 3 percent slopes, Rio Arriba County, New Mexico, about 1 mile west of El Vado Reservoir; located about 2,480 feet north and 50 feet east of the southwest corner of Sec. 13, T. 28 N., R. 1 E.; Apache Mesa USGS quad; lat. 36 degrees 38 minutes 02 seconds N. and long. 106 degrees 47 minutes 15 seconds W., NAD 27.

A—0 to 18 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; weak fine granular structure; hard, firm, moderately sticky and moderately plastic; common very fine roots; few very fine tubular pores; slightly effervescent; few fine distinct yellowish brown (10YR 5/8) moist redox concentrations; slightly alkaline (pH 7.8); clear smooth boundary.

Bwg1—18 to 35 inches; light brownish gray (10YR 6/2) clay loam, dark gray (10YR 4/1) moist; weak fine subangular blocky structure; very hard, firm, moderately sticky and moderately plastic; common very fine roots; few very fine tubular pores; few fine soft round carbonate masses; slightly effervescent; few fine distinct dark yellowish brown (10YR 4/6) redox concentrations; moderately alkaline (pH 8.0); clear smooth boundary.

Bwg2—35 to 60 inches; light brownish gray (10YR 6/2) sandy clay loam, grayish brown (10YR 5/2) moist; weak fine subangular blocky structure; very hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; common fine soft round carbonate masses; strongly effervescent; many medium distinct yellowish brown (10YR 5/6) redox concentrations; 5 percent pebbles moderately alkaline (pH 8.0); clear smooth boundary.

Cg—60 to 80 inches; gray (10YR 6/1) sandy clay loam, gray (10YR 5/1) moist; massive; hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine tubular pores; few coarse soft round masses of carbonate; slightly effervescent; many coarse distinct yellowish brown (10YR 5/4) redox concentrations; moderately alkaline (pH 8.0); clear smooth boundary.

Range in Characteristics

Depth to endosaturation: 18 to 36 inches
Particle-size control section (weighted average):
Clay content: 28 to 35 percent
Sand content: 10 to 40 percent

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5, dry or moist
Chroma: 1 to 2, dry or moist
Clay content: 28 to 35 percent
Calcium carbonate equivalent: 0 to 5 percent
EC (mmhos/cm): 0 to 2
SAR: 0 to 5

Bwg horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 1 to 2, dry or moist
Texture: clay loam, sandy clay loam
Clay content: 25 to 35 percent
Calcium carbonate equivalent: 0 to 5 percent
EC (mmhos/cm): 0 to 2
SAR: 0 to 5
Soil reaction: slightly to moderately alkaline

Cg horizon:
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 1 or 2, dry or moist

Texture: clay loam, sandy clay loam
Clay content: 28 to 35 percent
Calcium carbonate equivalent: 0 to 5 percent
EC (mmhos/cm): 0 to 2
SAR: 0 to 5
Soil reaction: slightly to moderately alkaline

Horselake Series

The Horselake series consists of moderately deep, well drained soils that formed in alluvium and residuum derived from shale. Horselake soils are on low shale hills. Slopes range from 1 to 10 percent Elevation is 6,900 to 7,700 feet. Mean annual precipitation is 15 to 17 inches, and the mean annual temperature is about 45 degrees F.

Typical pedon of Horselake loam, in an area of Horselake-Menefee complex, 3 to 25 percent slopes, Rio Arriba County, New Mexico, Jicarilla Apache Indian Nation; about 2 miles south of Stone Lake; 1,000 feet north, 100 feet west of the southeast corner of Sec. 1, T. 28 N., R. 1 E.; Cedar Canyon USGS quad; lat. 36 degrees 39 minutes 50 seconds N, long. 106 degrees 52 minutes 40 seconds W.; NAD 27.

A—0 to 3 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate very fine granular structure; soft, friable, sticky and plastic; many very fine roots; slightly alkaline (pH 7.6); clear smooth boundary.

Bt—3 to 9 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium and fine angular blocky structure; hard, very firm, very sticky and very plastic; common very fine, fine, and medium roots; common very fine tubular pores; common distinct clay films on faces of peds; slightly alkaline (pH 7.8); abrupt smooth boundary.

Btss1—9 to 14 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate coarse prismatic structure parting to moderate medium and fine angular blocky; very hard, very firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; common distinct clay films on faces of peds; common prominent (1 inch wide) slickensides; slightly alkaline (pH 7.8); clear smooth boundary.

Btss2—14 to 22 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; moderate medium and coarse angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine, roots; common very fine tubular pores; common distinct clay films on faces of peds; many prominent slickensides (1 to 2 inches wide); slightly effervescent; slightly alkaline (pH 7.8); abrupt smooth boundary.

Btk—22 to 31 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; weak medium and fine angular blocky structure; hard, firm, sticky and plastic; few very fine, fine and medium roots; common very fine tubular pores; common distinct clay films on faces of peds; common medium and fine carbonate seams, slightly effervescent; 10 percent pararock pebbles; moderately alkaline (pH 8.0); 3 percent subangular shale gravels; clear smooth boundary.

C—31 to 36 inches; grayish brown (10YR 5/2) very channery clay loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; hard; firm; sticky and plastic; slightly effervescent; 50 percent pararock channers; slightly alkaline (pH 7.8); clear smooth boundary.

Cr—36 inches; soft shale; strongly effervescent

Range in Characteristics

Depth to paralithic contact: 20 to 40 inches to shale
Depth to secondary calcium carbonate: 10 to 22 inches
Particle-size control section (weighted average):
Clay content: 45 to 60 percent
Sand content: 15 to 35 percent
Rock fragments: 0 to 15 percent
Size: channers and gravel
Kind: subangular shale and siltstone

A horizon:
Hue: 10YR or 2.5Y
Value: 4 to 5 dry 3 to 4 moist
Chroma: 2 to 3, dry or moist
Clay content: 27 to 35 percent
Rock fragments: 0 to 5 percent
Content: 0 to 5 percent
Size: gravel
Kind: subangular shale and siltstone
Reaction: neutral to slightly alkaline

Bt horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: clay loam, silty clay loam, or clay
Clay content: 45 to 60 percent
Rock fragments: 0 to 5 percent
Content: 0 to 5 percent
Size: gravel
Kind: subangular shale and siltstone
Calcium carbonate equivalent: 0 to 5 percent
Reaction: neutral to slightly alkaline

Btk horizon:
Hue: 10YR or 2.5Y
Value: 4 to 7, dry or moist
Chroma: 2 to 3, dry or moist

Texture: clay loam or clay
Clay content: 40 to 60 percent
Rock fragments:
Content: 0 to 5 percent
Size: gravel
Kind: subangular shale and siltstone
Calcium carbonate equivalent: 2 to 10 percent
EC (mmhos/cm): 0 to 2
Gypsum: 0 to 5 percent
SAR: 0 to 5
Reaction: slightly to moderately alkaline

C horizon (where present):
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 2 to 3, dry or moist
Texture: clay loam or clay
Clay content: 28 to 40 percent
Rock fragments:
Content: 5 to 50 percent
Size: channers or gravel
Kind: subangular shale and siltstone
Calcium carbonate equivalent: 0 to 10 percent
EC (mmhos/cm): 0 to 2
Gypsum: 0 to 5 percent
SAR: 0 to 5
Reaction: slightly to moderately alkaline

Hosta Series

The Hosta series consists of very deep, well drained soils that formed in alluvium from sandstone and shale and are on fans and valleys. Slope is 1 to 5 percent. Elevation is 6,900 to 7,600 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Hosta loam, 1 to 5 percent slopes; Rio Arriba County, New Mexico, about 5 miles southwest of El Vado Dam; located about 2,500 feet south and 1,900 feet west of the northeast corner of Sec. 23, T. 27 N., R. 1 E.; Pounds Mesa USGS quad; lat. 36 degrees 32 minutes 18 seconds N. and long. 106 degrees 47 minutes 39 seconds W., NAD 27.

A—0 to 2 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly alkaline (pH 7.6); clear smooth boundary.

Bt1—2 to 10 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine, fine and few medium roots; common faint clay films on faces of peds; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

Bt2—10 to 27 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; weak fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; common very fine, fine and few medium roots; common faint clay films on faces of peds and lining interstitial pores; 5 percent pebbles in discontinuous pockets; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

Btk—27 to 37 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; few very fine and fine roots; few faint clay films on faces of peds; violently effervescent; common fine filaments of calcium carbonate; moderately alkaline (pH 8.0); clear smooth boundary.

Bk1—37 to 43 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, moderately sticky and moderately plastic; violently effervescent, common fine filaments of calcium carbonate; 5 percent gravel; moderately alkaline (pH 8.2); clear smooth boundary.

Bk2—43 to 72 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; violently effervescent, common fine filaments of calcium carbonate; 5 percent pebbles; moderately alkaline (pH 8.0); clear smooth boundary.

Bk3—72 to 80 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; strongly effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 3 or 4 moist
Chroma: 2 or 3, dry or moist

Bt or Btk horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 or 3, dry or moist
Texture: clay loam, clay, silty clay loam

Bk or Btk horizons:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 or 3, dry or moist
Texture: clay, clay loam, silt loam, loam

Ishkoten Series

The Ishkoten series consists of moderately deep, well drained soils that formed in slope alluvium over residuum derived from shale and sandstone. Ishkoten soils are on hills and mountain slopes. Slope is 3 to 65 percent. Elevation is 7,200 to 8,600 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Ishkoten cobbly sandy loam, in an area of Ishkoten-Lajuita-Escrito complex 15 to 60 percent slopes, Rio Arriba County, New Mexico, about 1/4 mile north of Wells Look Out tower; located 1,900 feet east and 1,980 feet south of the northwest corner of Sec. 29, T. 31 N., R 2 W.; John Mills Lake USGS quad; lat. 36 degrees 52 minutes 18 seconds N. and long. 107 degrees 04 minutes 07 seconds W., NAD 27.

Oi—0 to 1 inch; slightly decomposed pine and oak litter.

A—1 to 6 inches; brown (10YR 5/3) cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine roots; 5 percent gravel, 15 percent cobble, and 5 percent stone; neutral (pH 6.8); clear smooth boundary.

Bt1—6 to 11 inches; brown (7.5YR 5/3) cobbly sandy clay, brown (7.5YR 4/3) moist; strong fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine, fine and medium roots; many distinct clay films on faces of peds; 10 percent gravel and 10 percent cobble; neutral (pH 6.8); clear smooth boundary.

Bt2—11 to 22 inches; brown (7.5YR 5/4) cobbly sandy clay, brown (7.5YR 4/4) moist; strong medium and fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; common fine, medium, and coarse roots; common very fine tubular pores; many distinct clay films on faces of peds; 7 percent cobble, 10 percent gravel; slightly acid (pH 6.4); gradual smooth boundary.

Bt3—22 to 34 inches; strong brown (7.5YR 5/6) sandy clay loam, strong brown (7.5YR 4/6) moist; moderate medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; common fine, medium, and coarse roots; common very fine tubular pores; common distinct clay films on faces of peds; slightly acid (pH 6.4); gradual smooth boundary.

Cr—34 to 48 inches; weakly cemented sandstone with faint clay films in cracks.

Range in Characteristics

Depth to the base of the argillic: 23 to 38 inches
Depth to paralithic contact: 20 to 40 inches

Particle-size control section: (weighted average):
Clay content: 35 to 42 percent
Sand content: 30 to 50 percent
Rock fragments:
Content: 5 to 25 percent
Size: gravel, cobble, and stone
Kind: subrounded sandstone
Pararock fragments:
Content: 0 to 25 percent
Size: gravel or channers
Kind: noncalcareous subrounded shale fragments

A horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Clay content: 16 to 22 percent
Rock fragments: 0 to 35 percent
Soil reaction: slightly acid or neutral
Other features: Surface layer may contain 0 to 35 percent pebbles, cobble, and stone; rock fragments generally decrease with depth, pararock fragments increase with depth.

Bt horizons:
Hue: 7.5YR to 2.5Y
Value: 4 to 6 dry, 4 to 5 moist
Chroma: 2 to 6, dry or moist
Texture of the fine earth fraction: clay loam, sandy clay, or clay
Clay content: 30 to 45 percent
Rock fragment: 0 to 35 percent
Soil reaction: slightly acid or neutral

Jaythree Series

The Jaythree series consists of very deep, well drained soils that formed in alluvium derived from arkosic sandstone and shale. Jaythree soils are in valleys and drainageways. Slope is 1 to 15 percent. Elevation is 7,000 to 7,800 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Jaythree sandy loam, in an area of Jaythree-Cedarsprings complex, 3 to 15 percent slopes, Rio Arriba County, New Mexico, about 10 miles west of Heron Reservoir; located about 2,500 feet west and 500 feet north of the southeast corner of Sec. 27, T. 29 N., R. 1 W.; Cedar Canyon USGS quad; lat. 36 degrees 41 minutes 30 seconds N. and long. 106 degrees 55 minutes 15 seconds W., NAD 27.

Oi—0 to 0.5 inch; slightly decomposed needle litter.

A—0.5 inch to 2 inches; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2)

moist; weak fine granular structure; soft, friable, nonsticky and nonplastic; many very fine and fine roots; slightly acid (pH 6.2); clear smooth boundary.

AB—2 to 12 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine, few medium roots; common very fine tubular pores; few faint clay films on faces of peds; slightly acid (pH 6.4); clear smooth boundary.

Bt1—12 to 24 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine, few medium roots; common very fine tubular pores; common faint clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

Bt2—24 to 40 inches; light yellowish brown (2.5Y 6/4) sandy clay loam, olive brown (2.5Y 4/3) moist; weak, fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine, fine, and medium roots; common very fine tubular pores; common faint clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

C—40 to 80 inches; light yellowish brown (2.5Y 6/4) sandy clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and medium roots; few very fine tubular pores; neutral (pH 6.8); clear smooth boundary.

Range in Characteristics

Thickness of the mollic epipedon: 20 to 40 inches
Particle-size control section (weighted average):
Clay content: 20 to 35 percent
Sand content: 40 to 70 percent
Rock fragments:
Content: 0 to 10 percent
Size: pebbles
Kind: subangular to rounded arkosic sandstone
Other features: some pedons have 4- to 16-inch subhorizons of clay loam texture.

A horizon:
Value: 3 to 5, dry or moist
Chroma: 1 or 2, dry or moist
Clay content: 10 to 20 percent
Rock fragments: 0 to 10 percent
Soil reaction: slightly acid to neutral

AB horizon (where present):
Value: 3 to 5, dry or moist
Chroma: 1 or 2, dry or moist
Texture: sandy loam or sandy clay loam
Clay content: 10 to 22 percent
Rock fragments: 0 to 10
Soil reaction: slightly acid to neutral

Bt horizon:
Value: 2 to 6, dry or moist
Chroma: 1 to 4, dry or moist
Texture: sandy clay loam or sandy loam
Clay content: 18 to 35 percent
Rock fragments: 0 to 10 percent
Soil reaction: slightly acid to neutral

C horizon (where present):
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 3 or 4, dry or moist
Texture: sandy loam or sandy clay loam
Clay content: 10 to 25 percent
Rock fragments: 0 to 10 percent
Soil reaction: slightly acid to neutral

Jicarilla Series

The Jicarilla series consists of very deep, somewhat poorly drained soils that formed in fine-textured alluvium derived from sandstone and shale. Jicarilla soils are on alluvial valley floors, stream terraces, and drainageways. Slope is 0 to 4 percent. Elevation is 6,750 to 8,000 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Jicarilla clay loam, in an area of Jicarilla-Ohwiler association, 1 to 8 percent slopes, Rio Arriba County, New Mexico, about 1.2 mile east of La Jara Lake; located about 1,750 feet west, 200 feet north of the southeast corner of Sec. 32, T. 30 N., R.1 W.; Cordova Canyon USGS quad; lat. 36 degrees 45 minutes 43 seconds N. and long. 106 degrees 57 minutes 19 seconds W., NAD 27.

A—0 to 3 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; soft, very friable, slightly sticky, slightly plastic; many very fine roots; few fine prominent yellowish brown (10YR 5/6) redox concentrations; neutral (pH 6.8); clear smooth boundary.

Bt1—3 to 21 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate fine and medium angular blocky structure; slightly hard, firm, moderately sticky, moderately plastic; many very fine roots; common faint clay films on faces of peds; few medium

prominent yellowish brown (10YR 5/6) redox concentrations; neutral (pH 6.8); clear smooth boundary.

Bt2—21 to 32 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; moderate medium prismatic structure parting to strong fine and medium angular blocky; hard, firm, moderately sticky, moderately plastic; many very fine roots; common very fine tubular pores; many prominent clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) redox concentrations; neutral (pH 7.2); gradual smooth boundary.

Btg1—32 to 42 inches; gray (10YR 5/1) clay, dark gray (10YR 4/1) moist; strong medium prismatic structure parting to strong medium angular blocky; hard, firm, moderately sticky, moderately plastic; common very fine roots; common very fine tubular pores; many prominent clay films on faces of peds; slightly effervescent; common coarse prominent yellowish brown (10YR 5/6) redox concentrations; slightly alkaline (pH 7.8); gradual smooth boundary.

Btg2—42 to 60 inches; gray (10YR 5/1) sandy clay loam, dark gray (10YR 4/1) moist; weak fine and medium angular blocky structure; hard, firm, moderately sticky, moderately plastic; few very fine roots; common very fine tubular pores; slightly effervescent; few faint clay films on faces of peds; many coarse prominent yellowish brown (10YR 5/6) redox concentrations; slightly alkaline (pH 7.8); gradual smooth boundary.

2Cg—60 to 80 inches; gray (10YR 5/1) stratified sandy clay loam with thin strata of loamy sand, dark gray (10YR 4/1) moist; single grain and weak medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; slightly effervescent; many coarse prominent yellowish brown (10YR 5/6) redox concentrations; slightly alkaline (pH 7.6).

Range in Characteristics

Thickness of the mollic epipedon: 25 to 46 inches
Depth to lithologic discontinuity: 40 to 80 inches to stratified materials
Depth to the base of the argillic horizon: 40 to 80 inches
Depth to endosaturation: 20 to 40 inches from March to June
Particle-size control section (weighted average):
Clay content: 36 to 45 percent
Sand content: 15 to 35 percent fine and coarser sand
Rock fragments: 0 to 5 percent sandstone gravel

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 1 or 2, dry or moist
Rock fragments: less than 5 percent
Calcium carbonate equivalent: 0 to 5 percent
Soil reaction: neutral to slightly alkaline

Bt horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 2 to 4 moist
Chroma: 1 or 2, dry or moist
Texture: clay loam, clay, or silty clay
Clay content: 35 to 45 percent
Rock fragments: less than 5 percent
Calcium carbonate equivalent: 0 to 5 percent
Soil reaction: neutral to slightly alkaline

Btg horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 1 or 2, dry or moist
Texture: clay loam, sandy clay loam, clay, or silty clay
Clay content: 30 to 45 percent
Rock fragments: less than 5 percent
Calcium carbonate equivalent: 0 to 5 percent
Soil reaction: neutral to slightly alkaline

2Cg horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 2 to 5 moist
Chroma: 1 to 6, dry or moist
Texture: sandy clay loam, clay
Clay content: 25 to 45 percent
Rock fragments: less than 5 percent
Calcium carbonate equivalent: 0 to 5 percent
Soil reaction: neutral to slightly alkaline

Kwakina Series

The Kwakina series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils that formed in alluvium derived from sandstone on floodplains and bars. Slope is 0 to 2 percent. Elevation is 6,450 to 7,000. The mean annual precipitation is 10 to 12 inches. The mean air annual temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Kwakina loamy fine sand in an area of Riverwash-Kwakina-Tapicito complex, 0 to 3 percent slopes, at an elevation of 6,700 feet; Rio Arriba County, New Mexico, about 13 miles west of Lindrith; located about 1,900 feet east and 800 feet north of the southwest corner of Sec. 8, T. 24 N., R. 4 W.; Otero Store USGS quad; lat. 36 degrees 19 minutes 12 seconds N. and long. 107 degrees 16 minutes 45 seconds W., NAD 27.

A—0 to 2 inches; light yellowish brown (10YR 6/4)

loamy sand, yellowish brown (10YR 5/4) moist; weak coarse platy structure; soft, very friable, nonsticky and nonplastic; many very fine roots; slightly alkaline (pH 7.6); clear smooth boundary.

C1—2 to 24 inches; light yellowish brown (10YR 6/4) loamy sand, yellowish brown (10YR 5/4) moist; single grain; loose, loose, nonsticky and nonplastic; few very fine roots; common fine irregular pores; very slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C2—24 to 40 inches; brown (7.5YR 5/4) stratified loamy sand and sandy loam, brown (7.5YR 4/4) moist; single grain; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; few fine irregular pores; calcium carbonate is disseminated; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

C3—40 to 80 inches; light yellowish brown (10YR 6/4) loamy sand, yellowish brown (10YR 5/4) moist; single grain; loose, loose, nonsticky and nonplastic; moderately alkaline (pH 8.0); clear smooth boundary.

Range in Characteristics

Particle-size control section (weighted average):
Clay content: 5 to 18 percent
Sand content: greater than 40 percent, less than 50 percent very fine sand.

A horizon:
Hue: 2.5YR or 10YR
Value: 3 to 6, dry or moist
Chroma: 3 to 4, dry or moist
Soil reaction: slightly alkaline to strongly alkaline

C horizons:
Hue: 2.5YR or 10YR
Value: 3 to 6, dry or moist
Chroma: 3 to 8, dry or moist
Texture: stratified layers of loamy sand, fine sand, sand, sandy loam, fine sandy loam
Soil reaction: slightly alkaline to strongly alkaline
Percent calcium carbonate equivalent: 5 to 10 percent
EC (mmhos/cm): 2 to 8

Lajuita Series

The Lajuita series consists of shallow, well drained soils that formed in slope alluvium over residuum derived from sandstone and shale. Lajuita soils are on hillslopes and mountain slopes. Slope is 3 to 35 percent. Elevation is 6,800 to 8,600 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Lajuita cobbly sandy loam, in an area of Ishkoten-Lajuita-Escrito complex, 15 to 60 percent slopes, Rio Arriba County, New Mexico, about 5 miles west of Dulce; located about 2,400 feet east and 1,000 feet south of the northwest corner of Sec. 15, T. 13 N., R. 2 W.; Wirt Canyon USGS quad; lat. 36 degrees 55 minutes 57 seconds N. and long. 107 degrees 05 minutes 03 seconds W., NAD 27.

Oi—0 to 1 inch; slightly decomposed pine needles.

A—1 to 3 inches; dark gray (10YR 4/1) cobbly sandy loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, friable, nonsticky, nonplastic; common very fine and fine roots; 15 percent cobble, 5 percent gravel; slightly acid (pH 6.2); abrupt smooth boundary.

Bt—3 to 11 inches; grayish brown (10YR 5/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; common fine, medium, and coarse roots; common very fine tubular pores, common distinct clay films on faces of peds; 5 percent gravel; neutral (pH 6.8); clear wavy boundary.

Cr—11 to 15 inches; partially weathered sandstone; few coarse roots in fractures; clear smooth boundary.

R—15 inches; hard sandstone.

Range in Characteristics

Depth to lithic contact: 10 to 20 inches to hard sandstone
Depth to paralithic contact (where present): 10 to 15 inches to soft sandstone
Depth to argillic horizon: 1 to 5 inches
Particle-size control section (weighted average):
Clay content: 20 to 32 percent
Sand content: 35 to 50 percent
Rock fragments: 0 to 35 percent
Content: 0 to 15 percent
Size: gravel
Kind: subangular sandstone
Content: 0 to 15 percent
Size: cobble
Kind: angular to subrounded sandstone
Content: 0 to 15 percent
Size: stone
Kind: angular to subrounded sandstone

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5, dry or moist
Chroma: 1 to 3, dry or moist
Clay content: 12 to 18 percent
Rock fragments: 0 to 35 percent
Soil reaction: neutral to slightly acid

Bt horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: sandy clay loam, clay loam
Clay content: 20 to 32 percent
Rock fragments: 0 to 15 percent
Soil reaction: neutral to slightly acid

Lindrith Series

The soils in the Lindrith series are very deep, well drained soils that formed in alluvium from sandstone and shale. Lindrith soils are on valley sides. Slope is 0 to 10 percent. Elevation is 6,600 to 7,400 feet. The mean annual precipitation is 12 to 14 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Lindrith loam, in an area of Royosa-Lindrith complex 2 to 7 percent slopes; Rio Arriba County, New Mexico, located about 2,000 east and 1,900 feet south of the northwest corner of Sec. 24, T. 25 N., R. 5 W.; Lapis Point USGS quad; lat. 36 degrees 23 minutes 14 seconds N. and long. 107 degrees 18 minutes 45 seconds W., NAD 27.

A—0 to 2 inches; pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure parting to moderate medium granular; soft, very friable, moderately sticky and moderately plastic; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

AC—2 to 7 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; common very fine and fine; few very fine and medium tubular pores; slightly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

C1—7 to 25 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine tubular and few medium tubular pores; slightly effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

C2—25 to 45 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; few very fine and fine tubular pores; slightly effervescent; strongly alkaline (pH 8.7); abrupt smooth boundary.

C3—45 to 60 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine and fine tubular pores; slightly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

C4—60 to 80 inches; pale brown (10YR 6/3) fine sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic, slightly effervescent; strongly alkaline (pH 8.5).

Range in Characteristics

Calcium carbonate equivalent: less than 15 percent
Rock fragments: 0 to 10 percent pebbles

A and AC horizons:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 6, dry or moist

C horizons:
Hue: 7. 5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 6, dry or moist
Texture: fine sandy loam, sandy loam, fine sand; often stratified, but averages 10 to 18 percent clay and 40 to 75 percent sand.

Lomapedro Series

The Lomapedro series consists of deep, well drained soils that formed in slope alluvium over residuum derived from sandstone and shale. Lomapedro soils are on cuestas, mesas, and structural benches. Slope is 1 to 15 percent. Elevation is 7,500 to 8,650 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Lomapedro loam, in an area of Zau-Lomapedro loams, 1 to 15 percent slopes, Rio Arriba County, New Mexico, about 2 miles east of Horse Lake; located about 2,650 feet west and 500 feet north of the southeast corner of Sec. 18, T. 30 N., R. 2 E.; Horse Lake USGS quad; lat. 36 degrees 52 minutes 17 seconds N. and long. 106 degrees 47 minutes 15 seconds W., NAD 27.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak fine platy structure 0.25 inch thick over weak fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine roots; neutral (pH 6.6); clear smooth boundary.

A2—2 to 8 inches; very dark grayish brown (10YR 3/2) loam, black (10YR 2/1) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; slightly acid (pH 6.4); clear smooth boundary.

A3—8 to 20 inches; dark grayish brown (10YR 4/3) loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine, few medium roots; few very fine and fine irregular pores; 5 percent pebbles and 5 percent cobble; slightly acid (pH 6.4); clear smooth boundary.

Bt1—20 to 26 inches; brown (7.5YR 5/2) clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few fine and medium roots; common very fine and fine irregular pores; few distinct clay films on faces of peds; 5 percent pebbles and 5 percent cobble; slightly acid (pH 6.4); abrupt smooth boundary.

Bt2—26 to 37 inches; light brown (7.5YR 6/4) clay, dark reddish gray (5YR 4/2) moist; strong medium prismatic structure parting to strong medium subangular blocky; extremely hard, extremely firm, very sticky and very plastic; few fine and medium roots; few very fine and fine irregular pores; common prominent clay films on faces of peds; 5 percent pebbles and 5 percent cobble; slightly acid (pH 6.4); clear smooth boundary.

Bt3—37 to 52 inches; brownish yellow (10YR 6/6) clay loam yellowish brown (10YR 5/4) moist, common medium distinct light gray (10YR 7/2) lithochromic mottles; moderate fine subangular blocky structure; very hard, very firm, moderately sticky and moderately plastic; few fine and medium roots; few very fine and fine irregular pores; common distinct clay films on faces of peds; 5 percent pebbles and 5 percent cobble; slightly alkaline (pH 7.4); abrupt smooth boundary.

Cr—52 inches; interbedded sandstone and shale.

Range in Characteristics

Depth to paralithic contact: 40 to 60 inches to interbedded sandstone and shale
Depth to argillic horizon: 7 to 26 inches
Thickness of the mollic epipedon: 20 to 41 inches
Particle-size control section (weighted average):
Clay content: 36 to 48 percent
Sand content: 16 to 35 percent
Rock fragments:
Content: 0 to 15 percent
Size: gravel, cobble, stone
Kind: subrounded sandstone

A horizon:
Hue: 7.5YR or 10YR
Value: 2 to 5 dry, 2 or 3 moist
Chroma: 1 to 3, dry or moist
Soil reaction: neutral to slightly acid

Bt horizons:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 2 to 4 moist
Chroma: 2 to 4, dry or moist
Texture: clay, clay loam or loam
Soil reaction: neutral to slightly acid

Losindios Series

The Losindios series consists of very deep, well drained soils that formed in alluvium derived from arkosic sandstone and shale. Losindios soils are on toeslopes and valleys. Slope is 1 to 15 percent. Elevation is 7,000 to 7,800 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Losindios sandy loam, in an area of Losindios-Jaythree complex, 3 to 25 percent slopes, Rio Arriba County, New Mexico, about 7.7 miles southwest of El Vado Reservoir; located about 1,200 feet south and 1,000 feet west of the northeast corner of Sec. 2, T. 27 N., R. 1 W.; Los Indios Canyon USGS quad; lat. 36 degrees 35 minutes 07 seconds N. and long. 106 degrees 53 minutes 57 seconds W., NAD 27.

Oi—0 to 1 inch; needle litter.

A—1 to 2 inches; brown (10YR 4/3) sandy loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; slightly acid (pH 6.1); clear smooth boundary.

Bt1—2 to 9 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots, many very fine tubular pores; common distinct clay films on faces of peds; neutral (pH 6.6); clear smooth boundary.

Bt2—9 to 18 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine and fine, common, medium and coarse roots; common very fine tubular pores; common distinct clay films on faces of peds; neutral (pH 6.8); clear smooth boundary.

Bt3—18 to 37 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine and fine, common, medium and coarse roots;

common very fine tubular pores; few faint clay films on faces of peds; neutral (pH 7.2); clear smooth boundary.

C1—37 to 54 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, nonsticky and nonplastic; few very fine and fine, common medium and coarse roots; common very fine tubular pores; neutral (pH 7.2); clear smooth boundary.

C2—54 to 80 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, nonsticky and nonplastic; few very fine tubular pores; neutral (pH 7.0).

Range in Characteristics

Particle-size control section (weighted average):
Clay content: 20 to 35 percent
Sand content: 50 to 65 percent
Rock fragments: 0 to 10 percent
Content: 0 to 10 percent
Size: pebbles
Kind: subangular to rounded arkosic sandstone

A horizon:
Value: 2 to 4, dry or moist
Chroma: 1 to 3
Clay content: 10 to 20 percent
Rock fragments:
Content: 0 to 10 percent
Size: pebbles
Kind: subangular to rounded arkosic sandstone
Soil reaction: slightly acid to neutral

Bt horizons:
Hue: 7.5YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 3 or 4, dry or moist
Clay content: 18 to 35 percent
Sand content: 50 to 65 percent
Rock fragments:
Content: 0 to 10 percent
Size: pebbles
Kind: subangular to rounded arkosic sandstone
Soil reaction: slightly acid to neutral

C horizons (where present):
Value: 4 to 6, dry or moist
Chroma: 4 to 6, dry or moist
Texture: sandy loam, sandy clay loam
Clay content: 10 to 24 percent
Rock fragments:
Content: 0 to 10 percent
Size: pebbles
Kind: subangular to rounded arkosic sandstone
Soil reaction: moderately acid to neutral

Menefee Series

The Menefee series consists of very shallow and shallow, well drained soils that formed in colluvium and residuum derived from shale and are on mesas, breaks, and hillslopes. Slope is 2 to 45 percent. Elevation is 6,500 to 7,800 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free season is 100 to 130 days.

Typical pedon of Menefee clay loam, in an area of Vessilla-Menefee-Rock outcrop complex, 5 to 35 percent slopes; Rio Arriba County, New Mexico, about 18 miles north of Councelor ; located 1,900 feet south and 1,400 feet west of the northwest corner of Sec. 29, T. 26 N., R. 5 W.; Gonzales Mesa USGS quad; lat. 36 degrees 27 minutes 35 seconds N. and long. 107 degrees 23 minutes 15 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium granular structure; soft, very friable, moderately sticky and moderately plastic; few very fine and medium roots; slightly effervescent; neutral (pH 6.6); clear smooth boundary.

Bw—3 to 9 inches; pinkish gray (7.5YR 6/2) clay loam, brown (7.5YR 4/2) moist; weak subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; few very fine and coarse roots; few very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary.

Cr—9 to 21 inches; fractured shale.

Range in Characteristics

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 4 moist
Chroma: 3 or 4, dry or moist
Texture: loam, clay loam, or channery loam.
Rock fragments: 0 to 30 percent

Bw horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: clay loam, loam, silty clay loam
Rock fragments: 0 to 15 percent
Depth to paralithic contact 8 to 20 inches.

Millpaw Series

The Millpaw series consists of very deep, well drained soils that formed in alluvium derived from shale

and sandstone and are on fans and valley sides. Slope is 1 to 6 percent. Elevation is 7,000 to 7,700 feet. The mean annual precipitation is 14 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Millpaw loam, in an area of Vosburg-Millpaw complex, 2 to 8 percent slopes; Rio Arriba County, New Mexico, about 2.5 miles west of John Mills Lake; located about 700 feet west and 700 feet north of the southeast corner of Sec. 27, T. 30 N., R. 3 E.; Bixler USGS quad; lat. 36 degrees 46 minutes 38 seconds N. and long. 107 degrees 07 minutes 45 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine platy structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; few very fine tubular pores; neutral (pH 7.0); clear smooth boundary.

Bt1—3 to 9 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to strong fine angular blocky; hard, firm, moderately sticky and moderately plastic; common very fine roots; common very fine tubular pores; many distinct clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

Bt2—9 to 23 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to strong medium and fine angular blocky; hard, firm, moderately sticky and moderately plastic; common very fine roots; common very fine tubular pores; many distinct clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

Btk—23 to 43 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate fine angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; few faint clay films on faces of peds; common fine soft seams and filaments of calcium carbonate; slightly effervescent; slightly alkaline (pH 7.5); clear smooth boundary.

Bk—43 to 80 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak fine angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; very few very fine roots; common very fine tubular pores; common distinct clay films on faces of peds; common fine soft seams of calcium carbonate; violently effervescent; slightly alkaline (pH 7.5); clear smooth boundary.

Range in Characteristics

A horizon:
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Rock fragments: 0 to 5 percent
Soil reaction: neutral to slightly alkaline

Bt horizons:
Hue: 7.5YR or 10YR
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 2 or 3, dry or moist
Texture: clay or clay loam
Soil reaction: neutral to slightly alkaline

Bk horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 or 3, dry or moist
Texture: clay loam, loam

Nalivag Series

The Nalivag series consists of very deep, well drained soils that formed in alluvium derived from sandstone and shale. The Nalivag soils are in valleys. Slope is 2 to 8 percent. Elevation is 6,900 to 7,400 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Nalivag loam in an area of Orlie-Nalivag loams, 2 to 8 percent slopes; Rio Arriba County, New Mexico, about 5 miles southeast of Lindrith; located about 2,150 feet east and 100 feet north of the southwest corner of Sec. 2, T. 23 N., R. 2 W.; Five Lakes Canyon NE USGS quad; lat. 36 degrees 14 minutes 48 seconds N. and long. 107 degrees 01 minutes 10 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, very friable, moderately sticky and moderately plastic; few very fine roots; slightly acid (pH 6.3); clear smooth boundary.

C1—3 to 10 inches; brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) moist; massive; hard, firm, moderately sticky and moderately plastic; common fine and medium roots; common very fine tubular pores; slightly effervescent; neutral (pH 7.3); clear smooth boundary.

C2—10 to 15 inches; brown (7.5YR 5/4) loam, brown (7.5YR 4/4) moist; massive; hard, firm, slightly sticky and slightly plastic; common fine and medium roots; few very fine tubular pores; slightly effervescent; slightly alkaline (pH 7.8); gradual smooth boundary.

C3—15 to 27 inches; brown (7.5YR 5/4) silty clay loam, brown (7.5YR 4/4) moist; massive; hard, firm, moderately sticky and moderately plastic; common fine and medium roots; few fine tubular pores; few fine filaments of carbonate; slightly alkaline (pH 7.7); clear smooth boundary.

C4—27 to 39 inches; brown (7.5YR 5/4) loam, brown

(7.5YR 4/4) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; few fine soft masses of carbonate; strongly effervescent ; slightly alkaline (pH 7.8); clear wavy boundary.

C5—39 to 80 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; massive; hard, firm, moderately sticky and moderately plastic; few very fine roots; strongly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Rock fragments: 0 to 10 percent pebbles

A horizon:
Value: 4 or 5 moist
Chroma: 2 to 4, dry or moist

C horizons:
Value: 5 or 6 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: clay loam or loam

Nusmag Series

The Nusmag series consists of very deep, moderately well drained soils that formed in alluvium from shale and are on stream terraces. Slope is 0 to 3 percent. Elevation is 7,300 to 8,000 feet. The mean annual precipitation is 16 to 18 inches. The mean annual air temperature is 42 to 44 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of a Nusmag clay loam in an area of Nusmag-Tottles clay loams, 0 to 3 percent slopes; Rio Arriba County, New Mexico, 8.8 miles west and 4.0 miles south of Chama; in an unsurveyed area; Horse Lake USGS quad; lat. 36 degrees 50 minutes 54 seconds N. and long. 106 degrees 45 minutes 13 seconds W., NAD 27.

A—0 to 2 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; common fine tubular pores; slightly alkaline; clear smooth boundary.

Bw—2 to 18 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very firm, moderately sticky and moderately plastic; common very fine and fine roots; common fine and few very fine tubular pores; slightly effervescent; slightly alkaline; gradual smooth boundary.

C—18 to 80 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; massive; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; slightly alkaline; gradual smooth boundary.

Range in Characteristics

A seasonal water table is within 54 to 72 inches of the surface.
Reaction: slightly to moderately alkaline
Rock fragments: 0 to 15 percent pebbles.

A horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 1 to 3, dry or moist

Bw horizon:
Hue: 10YR or 2.5Y
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 1 to 3, dry or moist

C horizon:
Hue: 10YR or 2.5Y
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 or 3, dry or moist

Ohwiler Series

The Ohwiler series consists of very deep, well drained soils that formed in alluvium derived from sandstone and shale on valley sideslopes. Slope is 3 to 10 percent. Elevation is 6,800 to 7,800 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Ohwiler loam in an area of Suposo-Ohwiler complex, 1 to 10 percent slopes; Jicarilla Apache Nation, Rio Arriba County, New Mexico, located about 2,450 feet north and 1,500 feet east of the southwest corner of Sec. 26, T. 30 N., R. 1 E.; Horse Lake USGS quad; lat. 36 degrees 46 minutes 57 seconds N. and long. 106 degrees 47 minutes 48 seconds W., NAD 27.

A1—0 to 4 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak thin platy 0.25 inch over weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; few very fine discontinuous irregular pores; slightly acid (pH 6.4); clear smooth boundary.

A2—4 to 7 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine, fine and few medium roots; few fine discontinuous tubular pores; neutral (pH 6.6); clear smooth boundary.

Bt1—7 to 22 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; very fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine, fine and few medium roots; few medium tubular pores; few faint clay films on faces of peds and in pores; neutral (pH 6.6); clear smooth boundary.

Bt2—22 to 48 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; very fine subangular blocky structure; very hard, firm, moderately sticky and moderately plastic; common very fine, fine and few medium roots; common very fine and fine tubular pores; common faint clay films on faces of peds and in pore spaces; 3 percent sandstone gravel, 1 percent sandstone flags; neutral (pH 6.8); clear smooth boundary.

Bk1—48 to 62 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; massive; hard, friable, moderately sticky and moderately plastic; common very fine, fine, and few medium roots; common very fine, fine discontinuous tubular pores; few fine filaments of calcium carbonate; violently effervescent; 3 percent sandstone gravel, 1 percent sandstone flags; neutral (pH 7.2); clear smooth boundary.

Bk2—62 to 80 inches; grayish brown (2.5Y 5/2) sandy clay loam; dark grayish brown (2.5Y 4/2) moist; massive, very hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; many fine filaments of calcium carbonate; violently effervescent; 10 percent sandstone gravel, 3 percent sandstone flags; slightly alkaline (pH 7.6); clear smooth boundary.

Range in Characteristics

A horizon:
Hue: 10YR
Value: 3 to 5 dry, 2 moist
Chroma: 1 to 3, dry or moist

Bt horizons:
Hue: 10YR
Value: 4 to 6 dry, 2 to 5 moist
Chroma: 1 to 3, dry or moist
Texture: clay loam

Bk horizons (where present):
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 1 to 4, dry or moist
Texture: clay loam or sandy clay loam

C horizon (where present):
Hue: 10YR or 2.5Y
Value: 4 to 6, dry or moist
Chroma: 1 to 4, dry or moist
Texture: clay loam or sandy clay loam

Orlie Series

The Orlie series consists of very deep, well drained, moderately slowly permeable soils that formed in alluvium and eolian materials derived from shale and sandstone on mesas, hills, and valley sides. Slope is 0 to 8 percent. Elevation is 6,900 to 7,500 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Orlie loam, 0 to 8 percent slopes, Sandoval County, New Mexico; 6 miles west of the continental divide along the boundary of the Jicarilla Apache Nation; located about 1,075 feet south and 700 feet west of the northeast corner of Sec. 6, T.21 N., R. 3 E.; Taylor Ranch USGS quad; lat. 36 degrees 05 minutes 03 seconds N. and long. 107 degrees 11 minutes 31 seconds W., NAD 27.

A—0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; few coarse and common fine roots; moderately alkaline; clear smooth boundary.

Bt1—2 to 13 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common fine and very fine roots; few faint clay films on faces of peds; moderately alkaline; clear smooth boundary.

Bt2—13 to 22 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few fine and medium roots; few faint clay films on faces of peds; slightly effervescent; moderately alkaline; clear smooth boundary.

C1—22 to 36 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; massive; hard, firm, moderately sticky and moderately plastic; few very fine roots; slightly effervescent; moderately alkaline; clear smooth boundary.

C2—36 to 50 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; massive; slightly hard, friable, moderately sticky and moderately plastic; slightly effervescent; moderately alkaline; clear smooth boundary.

C3—50 to 80 inches; pale brown (10YR 6/3) silty clay loam, dark brown (10YR 4/3) moist; massive; hard, firm, moderately sticky and moderately plastic; few fine roots; slightly effervescent; moderately alkaline.

Range in Characteristics

Depth to the base of the Bt horizon: 20 to 40 inches
Rock fragments: 0 to 15 percent pebbles

A horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Soil reaction: neutral to moderately alkaline

Bt horizons:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 to 6, dry or moist
Texture: clay loam or silty clay loam
Clay content: 27 to 35 percent
Sand content: less than 35 percent with more than 15 percent fine sand or coarser, and more than half the sand separate is very fine sand
Soil reaction: slightly alkaline or moderately alkaline

C or Bk horizons (when present):
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: sandy clay loam, clay loam or silty clay loam
Soil reaction: slightly to strongly alkaline
Calcium carbonate equivalent: 5 to 10 percent

Oro Series

The Oro series consists of very deep, well drained soils that formed in alluvium derived from shale and sandstone. The Oro soils are on fans. Slope is 0 to 5 percent. Elevation is 6,500 to 7,200 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Oro clay loam in an area of Doakum-Oro complex, 0 to 5 percent slopes; Rio Arriba County, New Mexico, located about 2,575 feet south and 400 feet west of the northeast corner of Sec. 17, T. 23 N., R. 4 W.; Tancosa USGS quad; lat. 36 degrees 13 minutes 25 seconds N. and long. 107 degrees 16 minutes 13 seconds W., NAD 27.

A—0 to 2 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate very fine granular structure; soft, very friable, slightly sticky, and slightly plastic, common very fine roots; neutral (pH 7.2); clear smooth boundary.

Bt1—2 to 8 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; moderate medium prismatic structure parting to strong fine angular blocky; hard, very firm, very sticky and very plastic; common very fine roots; common distinct clay films on faces of peds; slightly alkaline (pH 7.5); clear smooth boundary.

Btss2—8 to 25 inches; light brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; common very fine roots; common slickensides and wedge-shaped aggregates; common distinct clay films on faces of peds; slightly alkaline (pH 7.6); clear smooth boundary.

2Bt3—25 to 33 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; moderate medium and fine angular blocky structure; hard, firm, sticky, and plastic; few very fine roots; common faint clay films on faces of peds; very slightly effervescent; slightly alkaline (pH 7.7); clear smooth boundary.

2Bk—33 to 39 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky, and plastic; few very fine tubular pores; common fine soft masses of secondary calcium carbonates; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

2C—39 to 80 inches; brown (10YR 5/3) loamy fine sand, brown (10YR 4/3) moist; single grain; loose; loose, nonsticky, and nonplastic; moderately alkaline (pH 7.9).

Range in Characteristics

Depth to lithic contact: more than 80 inches
Clay content: 35 to 50 percent, in the upper part; 5 to 25 percent in the lower part
Rock fragments: 0 to 10 percent, mostly pebbles
Depth to strongly contrasting layer: 15 to 35 inches

Cracks are greater than 5 mm wide throughout a thickness of 12 inches for some time in normal years.

A horizon:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 3 or 4 moist
Chroma: 3 or 4, dry or moist

Bt and Btss horizons:
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 to 4, dry or moist
Texture: silty clay, clay or clay loam
Clay content: 35 to 45 percent
Soil reaction: neutral to slightly alkaline

2Bt, 2Btk, and 2Bk horizons:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: fine sandy loam, sandy clay loam, or loam

Clay content: 5 to 25 percent
Soil reaction: slightly to moderately alkaline
Calcium carbonate equivalent: less than 15 percent

2C horizon:
Value: 4 or 6, dry or moist
Chroma: 3 or 4, dry or moist
Texture: loamy fine sand, fine sandy loam, sandy clay loam, or loam
Sand content: more than 35 percent
Clay content: 8 to 25 percent

Parkelei Series

The Parkelei series consists of very deep, well drained soils that formed in alluvium derived from sandstone and shale and are on hillslopes. Slope is 2 to 10 percent. Elevation is 6,700 to 7,800 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Parkelei fine sandy loam in an area of Parkelei-Menefee-Vessilla complex, 2 to 20 percent slopes; Rio Arriba County, New Mexico; about 6 miles south of Lindrith; located about 2,500 feet south and 500 feet west of the northeast corner of Sec. 20, T. 23 N., R. 2 W.; Five Lakes Canyon NE USGS quad; lat. 36 degrees 12 minutes 35 seconds N. and long. 107 degrees 03 minutes 20 seconds W., NAD 27.

A—0 to 2 inches; light yellowish brown (10YR 6/4) fine sandy loam, dark brown (10YR 3/3) moist; weak fine platy structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; neutral (pH 7.0); abrupt smooth boundary.

Bt—2 to 22 inches; yellowish brown (7.5YR 5/4) sandy clay loam, dark yellowish brown (7.5YR 4/6) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; common very fine tubular pores; common distinct clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

Btk—22 to 38 inches; light yellowish brown (7.5YR 6/4) sandy clay loam, dark yellowish brown (7.5YR 4/4) moist; weak medium and coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine and medium roots; common very fine tubular pores; common faint clay films on faces of peds; strongly effervescent; slightly alkaline (pH 7.6); gradual smooth boundary.

Bk—38 to 80 inches; light yellowish brown (7.5YR 6/4) sandy loam, yellowish brown (7.5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; slightly alkaline (pH 7.6).

Range in Characteristics

Rock fragments: 0 to 10 percent sandstone gravels or channers throughout

A horizon:
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 3 or 4, dry or moist

Bt and Btk horizons:
Value: 4 or 5 dry, 3 to 5 moist
Chroma: 4 to 6, dry or moist

Bk or C horizons (where present):
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 4 to 6, dry or moist
Texture: sandy clay loam, clay loam

Peney Series

The Peney series consists of shallow, well drained soils that formed in alluvium and colluvium derived from limestone and are on summits of hills. Slope is 3 to 20 percent. Elevation is 7,100 to 7,800 feet. The average annual precipitation is 15 to 17 inches. The average annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 115 days.

Typical pedon of Peney channery loam in an area of Peney-Ransect association, 1 to 20 percent slopes; Rio Arriba County, New Mexico; about 2.4 miles south and 2.9 miles west of junction of NM Highway 115 and U.S. Highway 84; located about 2,000 feet east and 100 feet south of the northwest corner of Sec. 31, T. 26N., R.4E.; Alire USGS quad; lat. 36 degrees 27 minutes 01 seconds N. and long. 106 degrees 33 minutes 23 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 5/3) channery loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine interstitial pores; 20 percent limestone fragments; violently effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

Bk1—3 to 7 inches; grayish brown (10YR 5/2) silt loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine, fine and medium roots; few very fine tubular pores; violently effervescent; few large calcium carbonate accumulations, slightly alkaline (pH 7.6); abrupt smooth boundary.

Bk2—7 to 10 inches; very pale brown (10YR 7/3) silt

loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, sticky and slightly plastic; few very fine and medium roots; few very fine tubular pores; violently effervescent; many large soft masses of calcium carbonate; slightly alkaline (pH 7.6); abrupt smooth boundary.

2R—10 inches; limestone bedrock.

Range in Characteristics

Depth to bedrock: 10 to 20 inches
Rock fragments: 0 to 15 percent channers

A horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: channery loam or very channery loam

Bk horizons:
Value: 4 to 7 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: loam, clay loam or silt loam

Pinavetes Series

The Pinavetes series consists of very deep, excessively drained soils that formed in eolian and alluvium derived from sandstone and are on valley sides. Slope is 2 to 10 percent. Elevation is 6,450 to 6,900 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Pinavetes loamy sand in an area of Pinavetes-Florita complex, 2 to 10 percent slopes; Rio Arriba County, New Mexico; about 4 miles northeast of Councelor; located about 850 east and 150 feet north of the southwest corner of Sec. 5, T. 23 N., R. 5 W.; Councelor USGS quad; lat. 36 degrees 14 minutes 22 seconds N. and long. 107 degrees 22 minutes 55 seconds W., NAD 27.

A—0 to 2 inches; pale brown (10YR 6/3) loamy sand, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and medium roots; neutral (pH 6.8); clear smooth boundary.

C1—2 to 9 inches; brown (10YR 5/3) loamy sand, brown (10YR 4/3) moist; single grain; loose, loose, nonsticky and nonplastic; few fine and medium roots; neutral (pH 7.2); clear smooth boundary.

C2—9 to 19 inches; light yellowish brown (10YR 6/4) loamy sand, brown (10YR 5/3) moist; single grain; loose, loose, nonsticky and nonplastic; few fine and medium roots; very slightly effervescent; slightly alkaline (pH 7.4); gradual smooth boundary.

C3—19 to 39 inches; light yellowish brown (10YR 6/4) sand, yellowish brown (10YR 5/4) moist; single grain; soft, loose, nonsticky and nonplastic; few very fine roots; very slightly effervescent; neutral (pH 6.8); gradual smooth boundary.

C4—39 to 80 inches; pale brown (10YR 6/3) sand, yellowish brown (10YR 5/4) moist; single grain; soft, loose, nonsticky and nonplastic; very slightly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

A horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist

C horizons:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist

Quimera Series

The Quimera series consists of shallow, well drained soils that formed in colluvium and alluvium derived from interbedded shale and sandstone. The Quimera soils are on hills. Slope is 15 to 35 percent. Elevation is 6,800 to 7,400 feet. The mean annual precipitation is 16 to 18 inches. The mean annual air temperature is 42 to 45 degrees F. and the frost-free period is 80 to 100 days.

Typical pedon of Quimera very channery clay loam in an area of Quimera-Ishkoten complex, 10 to 35 percent slopes; Rio Arriba County, New Mexico; about 1.5 miles north of Lumberton, on the Edith road; located about 1355 feet east of the southwest corner of Sec. 34, T. 32 N., R. 1 W.; Dulce USGS quad; lat. 36 degrees 57 minutes 05 seconds N. and long. 106 degrees 55 minutes 40 seconds W., NAD 27.

A—0 to 3 inches grayish brown (10YR 5/2) very channery clay loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; soft, very friable, moderately sticky and moderately plastic; few very fine and fine roots; common very fine interstitial pores; 55 percent channers; neutral; clear smooth boundary.

Bw—3 to 9 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and moderately plastic; few medium, fine, and very fine roots; common very fine tubular pores; 5 percent channers; slightly effervescent; neutral; clear smooth boundary.

BC—9 to 15 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, moderately sticky and moderately plastic;

few medium and fine roots; common very fine tubular pores; 10 percent channers; strongly effervescent; neutral; clear smooth boundary.

C—15 to 17 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/1) moist; massive; hard, firm, very sticky and moderately plastic; few medium and fine roots; few very fine tubular pores; strongly effervescent, moderately alkaline; clear smooth boundary.

2R—17 inches; hard calcareous sandstone and interbedded shale.

Range in Characteristics

Particle size control section (weighted average):
Rock fragment content: 0 to 10 percent channers
Clay content: 35 to 50 percent
Depth to lithic contact: 10 to 20 inches
Depth to base of the Bw horizon: 5 to 9 inches
Calcium carbonate equivalent: less than 15 percent

A horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 or 3, dry or moist

Bw horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 or 3, dry or moist
Reaction: neutral to slightly alkaline
Rock fragments: 0 to 15 percent channers

BC and C horizons:
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 1 or 2, dry or moist
Texture: clay loam or clay

Ransect Series

The Ransect series consists of moderately deep, well drained soils that formed in alluvium derived from limestone and are on knolls. Slope is 1 to 6 percent. Elevation is 7,100 to 7,800 feet. The average annual precipitation is 15 to 17 inches. The average annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 115 days.

Typical pedon of Ransect silty clay loam in an area of Peney-Ransect association, 1 to 20 percent slopes; Rio Arriba County, New Mexico; about 2.4 miles south and 2.8 miles west of junction of NM Highway 115 and U.S. Highway 84; located about 2,530 feet west and 100 feet south of the northeast corner of Sec. 31, T. 26 N., R. 4 E.; Alire USGS quad; lat. 36 degrees 27 minutes 02 seconds N. and long. 106 degrees 33 minutes 12 seconds W., NAD 27.

A—0 to 3 inches; light yellowish brown (10YR 6/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; few very fine tubular pores; strongly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Bk1—3 to 16 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; common fine and medium roots; few very fine tubular pores; violently effervescent, many soft rounded masses of calcium carbonate; slightly alkaline (pH 7.8); gradual smooth boundary.

Bk2—16 to 24 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; massive; hard, friable, moderately sticky and moderately plastic; few medium roots; few very fine tubular pores; violently effervescent, many soft rounded masses of calcium carbonates; slightly alkaline (pH 7.8); gradual smooth boundary.

Bk3—24 to 38 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; massive; hard, friable, moderately sticky and moderately plastic; few medium roots; few very fine tubular pores; violently effervescent, many soft rounded masses of calcium carbonate; slightly alkaline (pH 7.8); abrupt smooth boundary.

2R—38 inches; limestone bedrock.

Range in Characteristics

Depth to bedrock: 20 to 40 inches

A horizon:
Value: 5 or 6 dry, 4 or 5 moist

Bw and Bk horizons:
Value: 5 to 7 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Calcium carbonate: 40 to 60 percent

Roques Series

The Roques series consists of very deep, well drained soils that formed in alluvium derived from shale and are on valley sides. Slope is 2 to 8 percent. Elevation is 7,300 to 8,000 feet. The average annual precipitation is about 16 to 20 inches. The average annual air temperature is about 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Roques clay loam in an area of Roques-Nusmag clay loams, 1 to 8 percent slopes; Rio Arriba County, New Mexico, 2.5 miles west and 4.5 miles south of Chama; located about 1,000 feet north and 650 feet west of the southeast corner of Sec. 4, T. 30 N., R. 3 E.; Brazos USGS quad; lat. 36 degrees 50

minutes 05 seconds N. and long. 106 degrees 37 minutes 05 seconds W., NAD 27.

A—0 to 2 inches; light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; weak fine granular structure; soft, friable, moderately sticky and moderately plastic; few fine roots; few fine interstitial pores; neutral; abrupt smooth boundary.

Bw—2 to 15 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; weak coarse prismatic structure parting to weak coarse subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; few fine tubular pores; slightly effervescent; slightly alkaline; gradual smooth boundary.

Bk—15 to 80 inches; light olive brown (2.5Y 5/4) clay, olive brown (2.5Y 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; strongly effervescent, few fine soft masses of calcium carbonate; slightly alkaline.

Range in Characteristics

A horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist

B horizon:
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Depth to the base of the Bw horizon ranges from 11 to 25 inches.

Royosa Series

The Royosa series consists of very deep, somewhat excessively to excessively drained soils that formed in eolian material derived from sandstone and are on dunes. Slope is 2 to 7 percent. Elevation is 6,600 to 7,350 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Royosa sandy loam in an area of Lindrith-Royosa complex, 2 to 7 percent slopes; Rio Arriba County, New Mexico; about 1.5 miles north and 6 miles west of Lindrith; located about 2,300 feet south and 900 feet west of the northeast corner of Sec. 9, T. 24 N., R. 3 W.; Billy Rice USGS quad; lat. 36 degrees 19 minutes 33 seconds N. and long. 107 degrees 09 minutes 20 seconds W., NAD 27.

A—0 to 2 inches; yellowish brown (10YR 5/4) loamy fine sand, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; common very fine and fine interstitial pores; slightly effervescent; neutral (pH 7.0); abrupt smooth boundary.

C1—2 to 12 inches; yellowish brown (10YR 5/4) loamy sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and medium roots; few fine vesicular pores; slightly effervescent; neutral (pH 7.0); gradual smooth boundary.

C2—12 to 33 inches; light yellowish brown (10YR 6/4) loamy sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and medium roots; few very fine vesicular pores; slightly effervescent; neutral (pH 7.2); gradual smooth boundary.

C3—33 to 80 inches; yellowish brown (10YR 5/4) loamy sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; slightly effervescent; slightly alkaline (pH 7.4).

Range in Characteristics

A horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist

C horizons:
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist
Texture: loamy sand, loamy fine sand

Ruson Series

The Ruson series consists of very deep, well drained soils that formed in alluvium derived from shale and are on valleys. Slope is 1 to 3 percent. Elevation is 7,100 to 7,500 feet. The average annual precipitation is 12 to 16 inches. The average annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 115 days.

Typical pedon of Ruson silt loam in an area of Berryman-Ruson association, 1 to 8 percent slopes; Rio Arriba County, New Mexico, east of Berryman Ranch headquarters; located about 2,600 feet east and 1,980 feet north of the southwest corner of Sec. 34, T. 26 N., R 4 E.; Alire USGS quad; lat. 36 degrees 26 minutes 30 seconds N. and long. 106 degrees 30 minutes 00 seconds W., NAD 27.

A—0 to 2 inches; light brownish gray (2.5Y 6/2) silt loam, grayish brown (2.5Y 5/2) moist; weak fine granular structure; soft, very friable, moderately sticky and moderately plastic; few very fine and fine roots; few fine interstitial pores; strongly effervescent; moderately alkaline; clear smooth boundary.

C1—2 to 19 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; moderately alkaline; clear smooth boundary.

C2—19 to 80 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; massive; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; moderately alkaline.

Range in Characteristics

Rock fragments: 0 to 15 percent pebbles

A horizon:
Hue: 10YR or 2.5Y
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist

C horizons:
Hue: 10YR or 2.5Y
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: silty clay, silty clay loam, clay or clay loam

Skyute Series

The Skyute series consists of shallow, well drained soils that formed in residuum derived from andesite. Skyute soils are on mesas. Slope is 1 to 20 percent. Elevation is 8,200 to 8,600 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Skyute loam, in an area of Archmesa-Skyute complex, 1 to 25 percent slopes, Archuleta County, Colorado, about 8 miles west of Edith along the Jicarilla Apache Nation boundary; located about 1,000 feet north and 2,100 feet east of the southwest corner of Sec. 19, T. 32 N., R. 1-1/2 W.; Trujillo USGS quad; lat. 37 degrees 00 minutes 24 seconds N. and long. 107 degrees 00 minutes 12 seconds W., NAD 27.

A1—0 to 2 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; many few fine tubular pores; 5 percent angular gravel; neutral (pH 6.8); clear smooth boundary.

A2—2 to 9 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; few fine tubular pores; 5 percent angular gravel; neutral (pH 6.8); clear smooth boundary.

Bt1—9 to 13 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm; moderately sticky and moderately plastic; many fine, few very fine roots; few very fine tubular pores; common distinct clay films on faces of peds; 10 percent angular gravel; neutral (pH 6.8); gradual wavy boundary.

Bt2—13 to 17 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; common distinct clay films on faces of peds; 14 percent angular gravel; neutral (pH 6.8); abrupt wavy boundary.

R—17 to 21 inches; andesite bedrock

Range in Characteristics

Depth to lithic contact: 10 to 20 inches
Thickness of the mollic epipedon: 8 to 14 inches
Particle-size control section (weighted average):
Clay content: 20 to 35 percent
Sand content: 25 to 50 percent
Rock fragments:
Content: 0 to 15 percent
Size: flagstone
Kind: angular andesite
Content: 0 to 15 percent
Size: gravel
Kind: angular andesite

A horizons:
Hue: 7.5YR or 10YR
Value: 2 or 3 moist
Chroma: 2 to 4 dry, 1 to 3 moist
Clay content: 10 to 18 percent
Rock fragments: 0 to 15 percent

Bt horizons:
Hue: 7.5YR or 10YR
Value: 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: loam, clay loam
Clay content: 20 to 35 percent
Rock fragments: 0 to 15 percent

Skyvillage Series

The Skyvillage series consists of very shallow and shallow, well drained, moderately rapidly permeable soils that formed in windblown sediments and material derived from sandstone. Skyvillage soils are on escarpments, breaks, and edges of mesas. Slope is 2 to 40 percent. Elevation is 6,450 to 7,000 feet. The mean annual precipitation is 10 to 12 inches. The

mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Skyvillage sandy loam in an area of Skyvillage-Eslendo-Rock outcrop complex, 3 to 35 percent slopes; Rio Arriba County, New Mexico; located about 900 feet west and 850 feet north of the southeast corner of Sec. 19, T. 24 N., R. 5 W.; Tafoya Mesa USGS quad; lat. 36 degrees 17 minutes 33 seconds N. and long. 107 degrees 23 minutes 47 seconds W., NAD 27.

A—0 to 4 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; single grain; loose, very friable, nonsticky and nonplastic; few very fine and fine roots; violently effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

C—4 to 16 inches; yellowish brown (10YR 5/4) sandy loam, brown (10YR 4/3) moist; single grain; loose, very friable, nonsticky and nonplastic; few very fine and fine roots; violently effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

R—16 to 20 inches; sandstone.

Range in Characteristics

A and C horizons:
Hue: 10YR or 2.5YR
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 6, dry or moist
Texture: sandy loam, fine sandy loam
Rock fragments: 0 to 5 percent cobble and 0 to 10 percent pebbles on a weighted average
Soil reaction: slightly or moderately alkaline
Calcium carbonate equivalent: less than 15 percent
Depth to bedrock: 6 to 20 inches

Sparank Series

The Sparank series consists of very deep, well drained soils that formed in alluvium derived from shale and sandstone and are on valley sides and stream terraces. Slope is 0 to 3 percent. Elevation is 6,450 to 6,900 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Sparank silty clay loam in an area of Elias-Canyada-Sparank complex, saline-sodic, 0 to 3 percent slopes; Rio Arriba County, New Mexico; located about 2,600 feet south and 2,300 feet west of the northeast corner of Sec. 30, T. 24 N., R. 5 W.; Tafoya Canyon USGS quad; lat. 36 degrees 17 minutes 3 seconds N. and long. 107 degrees 24 minutes 22 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 5/3) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; soft, very friable, very sticky and very plastic; common fine roots; few fine tubular pores; strongly alkaline (pH 8.5); abrupt smooth boundary.

C1—3 to 7 inches; brown (10YR 5/3) silty clay, dark grayish brown (10YR 4/2) moist; weak medium prismatic structure; very hard, very firm, very sticky and very plastic; many very fine roots; few fine and medium tubular pores; slightly effervescent; strongly alkaline (pH 8.8); clear smooth boundary.

C2—7 to 14 inches; brown (10YR 5/3) silty clay, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; very hard, very firm, very sticky and very plastic; many very fine, fine and few to common medium and coarse roots; few fine and medium tubular pores; slightly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

C3—14 to 28 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; massive; very hard, firm, moderately sticky and moderately plastic; common very fine, fine, and medium roots; many very fine, fine, medium, and coarse tubular pores; slightly effervescent; moderately alkaline (pH 8.1); gradual wavy boundary.

C4—28 to 44 inches; light brownish gray (10YR 6/2) silty clay loam, brown (10YR 4/3) moist; massive; very hard, very firm, very sticky and very plastic; few very fine and fine roots; common very fine, fine, and medium tubular pores; slightly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

C5—44 to 60 inches; pale brown (10YR 6/3) silty clay, dark yellowish brown (10YR 4/4) moist; massive; very hard, very firm, very sticky and very plastic; few, very fine and fine roots; few very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.5); clear smooth boundary.

C6—60 to 80 inches; pale brown (10YR 6/3) sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, firm, slightly sticky and slightly plastic; few very fine tubular pores; slightly effervescent; strongly alkaline (pH 8.6).

Range in Characteristics

Calcium carbonate equivalent: less than 15 percent
EC (mmhos/cm): 1 to 8
SAR: 1 to 13

A horizon:
Hue: 10YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4 dry, 2 to 4 moist

C horizons:
Hue: 10YR or 7.5YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist

Texture: clay loam, silty clay, silty clay loam, sandy clay loam

Sparham Series

The Sparham series consists of very deep, well drained soils that formed in alluvium derived from shale and sandstone and are on flood plains. Slope is 0 to 3 percent. Elevation is 6,800 to 7,400 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Sparham, in an area of Sparham saline-sodic, 0 to 3 percent slopes; Rio Arriba County, New Mexico, about 3.3 miles south and 0.7 miles east of Llaves; located about 2,550 feet south and 1,530 feet west of the northeast corner of Sec. 8, T. 24 N., R. 1 E.; French Mesa USGS quad; lat. 36 degrees 19 minutes 33 seconds N. and long. 106 degrees 51 minutes 16 seconds W., NAD 27.

A—0 to 2 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; weak fine granular structure; very hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine interstitial pores; slightly effervescent; strongly alkaline; abrupt smooth boundary.

C1—2 to 25 inches; light yellowish brown (10YR 6/4) clay, yellowish brown (10YR 5/4) moist; massive; very hard, very firm, very sticky and very plastic; common very fine roots; common very fine tubular pores; slightly effervescent; strongly alkaline; clear smooth boundary.

C2—25 to 35 inches; pale yellow (2.5Y 7/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine tubular pores; slightly alkaline; gradual smooth boundary.

C3—35 to 80 inches; light gray (2.5Y 7/2) clay, light yellowish brown (2.5Y 6/4) moist; massive; very hard, very firm, very sticky and very plastic; few very fine roots; few very fine tubular pores; slightly effervescent; strongly alkaline.

Range in Characteristics

Rock fragments: 0 to 15 percent pebbles
EC (mmhos/cm): 2 to 16
SAR: 5 to 30

A horizon:
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist

C horizons:
Hue: 10YR or 2.5Y
Value: 5 to 7 dry, 4 to 6 moist
Chroma: 2 to 4, dry or moist
Texture: clay loam, clay, silty clay, or silty clay loam

Stratified layers of sandy clay or sandy loam are also present below 40 inches.

Suposo Series

The Suposo series consists of very deep, well drained soils that formed in alluvium derived from sandstone and shale and are on valley sides. Slope is 1 to 6 percent. Elevation is 6,800 to 7,700 feet. The mean annual precipitation is 16 to 18 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Suposo loam, from an area of Suposo-Ohwiler loams, 1 to 10 percent slopes; Rio Arriba County, New Mexico, located about 2,290 feet west and 1,200 feet south of the northeast corner of Sec. 27, T. 30 N., R. 1 E.; Horse Lake USGS quad; lat. 36 degrees 47 minutes 12 seconds N. and long. 106 degrees 48 minutes 47 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 4/3) loam, black (10YR 2/1) moist; weak thin platy 0.25 inch thick over weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; few very fine discontinuous irregular pores; neutral (pH 7.0); clear smooth boundary.

Bt1—3 to 11 inches; dark grayish brown (10YR 4/2) clay loam, black (10YR 2/1) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few very fine tubular pores; few faint clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

Bt2—11 to 29 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; strong medium prismatic parting to strong medium subangular blocky; very hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; common very fine tubular pores; many distinct clay films on faces of peds; neutral (pH 7.0); clear smooth boundary.

Bt3—29 to 50 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; strong medium subangular blocky structure; very hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few very fine discontinuous tubular pores; many distinct clay films on faces of peds; slightly alkaline (pH 7.6); clear smooth boundary.

B1k—50 to 65 inches; light olive brown (2.5Y 5/3) clay loam, grayish brown (2.5Y 5/2) moist; massive; very hard, firm, slightly sticky and slightly plastic; few

very fine tubular pores; common fine filaments of calcium carbonate; strongly effervescent; slightly alkaline (pH 7.8); 5 percent gravel; clear smooth boundary.

B2k—65 to 80 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (2.5Y 3/2) moist; massive; very hard, firm slightly sticky and slightly plastic; few fine filaments of calcium carbonate; strongly effervescent; slightly alkaline (pH 7.8); 5 percent gravel, 5 percent highly weathered sandstone flags.

Range in Characteristics

A horizon:
Hue: l0YR or 2.5Y
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 1 to 3, dry or moist

Bt horizons:
Hue: l0YR or 2.5Y
Value: 3 to 5 dry, 2 or 3 moist
Chroma: 1 to 3, dry or moist
Texture: clay loam, clay

Bk or Btk horizons:
Hue: 10YR or 2.5Y
Value: 4 to 6 dry, 3 to 5 moist
Chroma: 2 or 3, dry or moist
Texture: clay loam, clay

Tapicito Series

The Tapicito series consists of very deep, well drained soils that formed in alluvium derived from sandstone and shale. Tapicito soils are on stream terraces. Slope is 0 to 3 percent. Elevation is 6,450 to 7,200 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is 115 to 140 days.

Typical pedon of Tapicito very fine sandy loam, in and area of Riverwash-Kwakina-Tapicito complex, 0 to 3 percent slopes, at an elevation of 6,700 feet; Rio Arriba County, New Mexico, about 3.5 miles north of State Highway 44 and 537 intersection; located about 1,686 feet north and 600 feet west of the southeast corner of Sec. 8, T. 24 N., R. 4 W.; Otero Store USGS quad; lat. 36 degrees 19 minutes 20 seconds N. and long. 107 degrees 16 minutes 35 seconds W., NAD 27.

A—0 to 3 inches; light yellowish brown (10YR 6/4) very fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine platy structure; soft, very friable, nonsticky and nonplastic; common very fine roots; slightly alkaline (pH 7.6); abrupt smooth boundary.

Bw—3 to 7 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; soft very friable, nonsticky and nonplastic; common very fine roots; few very fine tubular pores; slightly alkaline (pH 7.6); clear smooth boundary.

C1—7 to 22 inches; brown (10YR 5/3) stratified very fine sandy loam and sandy clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; common very fine and fine roots; few very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.0) clear smooth boundary.

C2—22 to 39 inches; pale brown (10YR 6/3) stratified fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few very fine tubular pores; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

C3—39 to 52 inches; pale brown (10YR 6/3) stratified loamy fine sand, brown (10YR 5/3) moist; single grain; slightly hard, friable, nonsticky and nonplastic; few very fine roots; moderately alkaline (pH 8.0); clear smooth boundary.

C4—52 to 80 inches; light yellowish brown (10YR 6/4) stratified loamy sand, yellowish brown (10YR 5/4) moist; single grain; hard friable; nonsticky and nonplastic; slightly effervescent; few fine carbonate filaments; slightly alkaline (pH 7.6).

Range in Characteristics

Depth to secondary calcium carbonate: 0 to 9 inches
Particle-size control section (weighted average):
Clay content: 10 to 18 percent
Sand content: 45 to 85 percent
Rock fragments:
Content: 0 to 5 percent
Size: gravel
Kind: sandstone

A horizon:
Hue: 7.5 YR or 10YR
Value: 5 to 6, dry or moist
Chroma: 3 to 4, dry or moist
Calcium carbonate equivalent: 0 to 5 percent
EC (mmhos/cm): 0 to 4
SAR: 0 to 10
Soil reaction: slightly to moderately alkaline

Bw horizon:
Hue: 7.5 YR or 10YR
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: fine sandy loam, very fine sandy loam, or loam

Clay content: 10 to 18 percent
Calcium carbonate equivalent: 0 to 5 percent
Soil reaction: slightly to moderately alkaline

C horizons:
Hue: 7.5YR or 10YR
Value: 5 or 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist
Texture: fine sandy loam, loamy fine sand, loamy sand
Calcium carbonate equivalent: 0 to 5 percent
Soil reaction: slightly to moderately alkaline

Teequee Series

The Teequee series consists of deep, well drained soils that formed in slope alluvium and residuum derived from sandstone and shale. Teequee soils are on hillslopes. Slope is 5 to 55 percent. Elevation is 6,950 to 7,650 feet. The mean annual precipitation is 15 to 17 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Teequee cobbly clay loam, in an area of Teequee-Menefee-Vessilla complex, 5 to 40 percent slopes, Rio Arriba County, New Mexico, about 1.75 miles north of Ed Ladd Lake; located about 500 feet east and 200 feet south of the northwest corner of Sec. 11, T. 31 N., R. 3 W.; Carracas USGS quad; lat. 36 degrees 55 minutes 12 seconds N. and long. 107 degrees 07 minutes 37 seconds W., NAD 27.

A—0 to 2 inches; grayish brown (10YR 5/2) cobbly clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular; soft, friable; moderately sticky and moderately plastic; 10 percent cobble, 20 percent gravel; neutral (pH 7.2); clear smooth boundary.

Bt—2 to 8 inches; brown (7.5YR 5/3) clay, brown (7.5YR 4/3) moist; moderate medium and fine angular blocky structure; hard, firm; moderately sticky and moderately plastic; common very fine roots; common very fine tubular pores; many distinct clay films on faces of peds; 10 percent pararock pebbles; neutral (pH 7.2); clear smooth boundary.

Btss—8 to 20 inches; brown (7.5YR 5/2) clay, brown (7.5YR 4/2) moist; weak and moderate fine angular blocky structure; hard, firm; moderately sticky and moderately plastic; few very fine roots; common very fine tubular pores; common slickensides; common prominent clay films on faces of peds; 10 percent pararock pebbles; neutral (pH 7.2); clear smooth boundary.

Btkss1—20 to 31 inches; brown (7.5YR 5/2) clay, brown (7.5YR 4/2) moist; weak and moderate fine angular blocky structure; hard, firm; moderately sticky and moderately plastic; slightly effervescent; few very fine roots; common very fine tubular pores; common slickensides; common distinct clay films on faces of peds; common medium soft carbonate seams; 10 percent pararock pebbles; slightly alkaline (pH 7.8); gradual smooth boundary.

Btkss2—31 to 51 inches; brown (7.5YR 5/2) clay, brown (7.5YR 4/2) moist; weak and moderate fine angular blocky structure; hard, firm, moderately sticky and moderately plastic; slightly effervescent; few very fine tubular pores; common slickensides; common distinct clay films on faces of peds; common fine soft carbonate seams; 10 percent pararock pebbles; slightly alkaline (pH 7.8); clear smooth boundary.

Cr—51 to 61 inches; gray (7.5YR 5/1) clay, dark gray (7.5YR 4/1) moist; soft weathered shale.

Range in Characteristics

Depth to paralithic contact: 40 to 60 inches
Depth to secondary calcium carbonate: 20 to 31 inches
Vertic features: slickensides in a subhorizon of the argillic
Surface rock fragments: 15 to 35 percent
Particle-size control section (weighted average):
Clay content: 43 to 55 percent
Sand content: 15 to 35 percent
Rock fragments:
  Content: 0 to 15 percent
  Size: gravel, cobble and stone
  Kind: sandstone
Pararock fragments:
  Content: 0 to 15 percent
  Size: gravels, channers
  Kind: shale fragments

A horizon:
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 or 3, dry or moist
Clay content: 18 to 35 percent
Rock fragments: 15 to 35
Soil reaction: neutral to slightly acid

Bt and Btss horizons:
Hue: 7.5YR or 10YR
Value: 4 or 5, dry or moist
Chroma: 2 or 3, dry or moist
Texture: clay, clay loam,
Clay content: 40 to 55 percent
Rock fragments: 0 to 15 percent
Pararock fragments: 0 to 10 percent
Calcium carbonate equivalent: 0 to 5 percent
EC (mmhos/cm): 0 to 2
Soil reaction: neutral to slightly alkaline

Btkss horizons:

Hue: 7.5YR to 2.5Y
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: clay, clay loam, sandy clay
Clay content: 35 to 55 percent
Rock fragments: 0 to 15 percent
Pararock fragments: 0 to 15 percent
Calcium carbonate equivalent: 1 to 15 percent
EC (mmhos/cm): 0 to 4

Teromote Series

The Teromote series consists of very deep, well drained soils that formed in alluvium derived from sandstone and shale and are in valleys. Slope is 0 to 3 percent. Elevation is 7,100 to 7,300 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 115 days.

Typical pedon of Teromote silty clay loam, 1 to 3 percent slopes, Sandoval County, New Mexico, about 7 miles north of Cuba; located about 1,600 feet west and 2,000 feet north of the southeast corner of Sec. 23, T. 22 N., R. 2 W.; Arroyo Chijuilita USGS quad; lat. 36 degrees 07 minutes 12 seconds N. and long. 107 degrees 00 minutes 45 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; neutral (pH 7.3); clear smooth boundary.

Bw1—3 to 8 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; neutral (pH 7.3); clear smooth boundary.

Bw2—8 to 15 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; slightly alkaline (pH 7.6); clear smooth boundary.

Bk—15 to 19 inches; brown (10YR 5/3) silty clay loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine tubular pores; slightly effervescent; few fine irregular soft seams of carbonate; slightly alkaline (pH 7.8); clear smooth boundary.

C1—19 to 40 inches; brown (10YR 5/3) stratified fine sandy loam and silty clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine tubular pores; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

C2—40 to 80 inches; yellowish brown (10YR 5/4) clay loam; dark yellowish brown (10YR 4/4) moist; massive; hard, firm, moderately sticky and moderately plastic; slightly effervescent; slightly alkaline (pH 7.8).

Range in Characteristics

Calcium carbonate equivalent: less than 15 percent
Percent clay in the 10- to 40-inch control section: 20 to 35 percent clay

A horizon:
Value: 4 to 6 dry, 4 or 5 moist
Chroma: 3 or 4, dry or moist

Bw horizons:
Hue: 10YR or 2.5Y
Value: 4 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: loam, silty clay loam, or sandy clay loam
Reaction: slightly to moderately alkaline

Bk horizon:
Hue: 10YR or 2.5Y.
Value: 4 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist
Texture: loam, silty clay loam or clay loam

C horizons (where present):
Hue: 10YR or 2.5Y.
Value: 4 to 7, dry or moist.
Chroma: 2 to 4, dry or moist
Texture: fine sandy loam or clay loam

Tottles Series

The Tottles series consists of very deep, poorly drained soils that formed in alluvium derived from shale on stream terraces and drainageways. Slope is 0 to 2 percent. Elevation is 7,200 to 8,000 feet. The average annual precipitation is 16 to 20 inches. The average annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Tottles clay loam in an area of Nusmag-Tottles clay loams, 0 to 3 percent slopes; Rio Arriba County, New Mexico, about 8.3 miles west and 2.0 miles south of Chama on the Humphries Wildlife Area; in an unsurveyed area; Sawmill Mesa USGS quad; lat. 36 degrees 51 minutes 52 seconds N. and long. 106 degrees 43 minutes 51 seconds W., NAD 27.

A1—0 to 6 inches; dark gray (10YR 4/1) clay loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; slightly hard, friable, slightly sticky

and slightly plastic; many very fine and fine roots; strongly effervescent; moderately alkaline; clear smooth boundary.

A2—6 to 21 inches; dark gray (10YR 4/1) clay, black (10YR 2/1) moist; few fine distinct yellowish brown (10YR 5/6) iron concentrations; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; moderately alkaline; clear smooth boundary.

A3—21 to 36 inches; black (N 2/0) clay, black (N 2/0) moist; few fine distinct yellowish brown (10YR 5/6) iron concentrations; weak subangular blocky structure; hard, very firm, moderately sticky and moderately plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; moderately alkaline; clear smooth boundary.

Cg1—36 to 54 inches; dark gray (10YR 4/1) clay, dark gray (10YR 4/1) moist; common to many medium distinct yellowish brown (10YR 5/8) iron concentrations; massive; very hard, very firm, moderately sticky and moderately plastic; few very fine and fine roots; few fine tubular pores; strongly effervescent; moderately alkaline; clear smooth boundary.

Cg2—54 to 80 inches; dark gray (10YR 4/1) clay, dark gray (10YR 4/1) moist; common medium distinct yellowish brown (10YR 5/8) iron concentrations; massive; very hard, very firm, moderately sticky and moderately plastic; few very fine and fine roots; few very fine tubular pores; strongly effervescent; moderately alkaline.

Range in Characteristics

Depth to endosaturation: 0 to 12 inches March through May; 12 to 36 inches the rest of the year
Thickness of the mollic epipedon: 25 to 40 inches

A horizon:
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 1 or 2, dry or moist

Bg horizon:
Value: 3 or 4 dry, 2 or 3 moist
Chroma: 1 or 2, dry or moist

Cg horizons:
Value: 2 to 5 dry, 2 to 4 moist
Chroma: 0 to 2, dry or moist

Tsosie Series

The Tsosie series consists of very deep, well drained, moderately slowly permeable soils that formed in alluvium derived from shale and sandstone on valleys and stream terraces. Slope is 0 to 5 percent. Elevation is 6,600 to 7,000 feet. The mean annual precipitation is 10 to 12 inches. The mean annual air temperature is 47 to 50 degrees F, and the frost-free period is days 115 to 140 days.

Typical pedon of Tsosie clay loam in an area of Blancot-Councelor-Tsosie complex, 0 to 5 percent slopes; Sandoval County, New Mexico, about 8 miles south of Lybrook; located about 1,100 feet north and 2,200 feet west of the southeast corner of Sec. 6 T. 21 N., R. 6 W.; Lybrook SE USGS quad; lat. 36 degrees 04 minutes 33 seconds N. and long. 107 degrees 30 minutes 31 seconds W., NAD 27.

A—0 to 2 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine continuous pores; slightly effervescent; moderately alkaline; clear smooth boundary.

C1—2 to 10 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; massive; hard, firm, slightly sticky and slightly plastic; common very fine roots; few very fine and fine continuous pores; slightly effervescent; strongly alkaline; clear gradual boundary.

C2—10 to 20 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; massive; very hard, very firm, moderately sticky and moderately plastic; few very fine roots; few very fine continuous pores; strongly effervescent; strongly alkaline; clear smooth boundary.

C3—20 to 26 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; few very fine continuous pores; slightly effervescent; strongly alkaline; clear smooth boundary.

C4—26 to 36 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, slightly plastic and slightly sticky; few very fine roots; few very fine continuous pores; slightly effervescent; strongly alkaline; clear smooth boundary.

C5—36 to 44 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and

slightly plastic; few very fine roots; moderately alkaline; clear smooth boundary.

C6—44 to 55 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; strongly alkaline; clear smooth boundary.

C7—55 to 80 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; strongly effervescent; strongly alkaline.

Range in Characteristics

Calcium carbonate equivalent: less than 15 percent
Particle-size control section:
Clay content: 18 to 35 percent, by weighted average
Rock fragments by volume: 0 to 15 percent, dominantly pebbles

A horizon:
Hue: 10YR or 2.5Y
Value: 5 to 7 dry, 4 or 5 moist
Chroma: 2 to 4, dry or moist

C horizons:
Hue: 10YR or 2.5Y
Value: 5 to 7 dry, 3 to 5 moist
Chroma: 2 to 4, dry or moist
Texture: clay loam, sandy clay loam, or loam in upper part. Stratified sandy loam through silty clay loam in the lower part.

Ustorthents

The Ustorthents consists of variable depth, well drained soils that formed in colluvium derived from sandstone and shale and are on escarpments. Slope is 25 to 80 percent. Elevation is 7,300 to 8,600 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Representative pedon of Ustorthents very cobbly sandy loam in an area of Ustorthents-Rock Outcrop complex, 35 to 80 percent slopes; Rio Arriba County, New Mexico, about 0.5 miles northwest of Dulce; located about 2,500 feet north and 100 feet east of the southwest corner of Sec. 36, T. 32 N., R. 2 W.; Wirt Canyon USGS quad; lat. 36 degrees 56 minutes 36 seconds N. and long. 107 degrees 00 minutes 10 seconds W., NAD 27.

A—0 to 2 inches; grayish brown (2.5Y 5/2) very cobbly sandy loam, dark grayish brown (2.5Y 4/2) moist; weak very fine granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine roots;10 percent gravel, 25 percent cobble, 5 percent stone; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

C—2 to 28 inches; light yellowish brown (2.5Y 6/3) very cobbly sandy loam, light olive brown (2.5Y 5/3) moist; massive, soft, very friable, nonsticky and nonplastic; few fine soft masses of gypsum; common very fine roots; 10 percent gravel, 25 percent cobble, 5 percent stone; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

Cr—28 inches; dark gray shale; slightly calcareous.

Range in Characteristics

Depth to bedrock: 5 to 40 inches
Particle size control section (weighted average):
Clay content: 10 to 20 percent

A and C horizons:
Rock fragments:
Content: 15 to 60 percent
Size: gravel, cobble, and stone
Kind: sandstone
Soil reaction: neutral to slightly alkaline

Vessilla Series

The Vessilla series consists of shallow and very shallow, well drained, moderately rapidly permeable soils that formed in slope alluvium, residuum, and minor amounts of eolian materials weathered from sandstone. Vessilla soils are on ridges, hills, breaks, and mesas. Slope is 1 to 45 percent. Elevation is 6,800 to 7,800 feet. The mean annual precipitation is 12 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the average frost-free period is 100 to 130 days.

Typical pedon of Vessilla sandy loam, in an area of Parkelei-Menefee-Vessilla complex, 2 to 20 percent slopes; Rio Arriba County, New Mexico, about 6 miles southwest of Lindrith; located about 1,500 feet north and 2,200 feet east of the southwest corner of Sec. 13 T. 23 N., R. 3 W.; Five Lakes Canyon NE USGS quad; lat. 36 degrees 13 minutes 14 seconds N. and long. 107 degrees 6 minutes 33 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

C1—3 to 10 inches; dark yellowish brown (10YR 4/4) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, many medium, and few course

roots; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

C2—10 to 18 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, many medium, and few coarse roots; moderately alkaline (pH 7.9); clear wavy boundary.

R—18 inches; sandstone, slightly effervescent; hardens with depth.

Range in Characteristics

Soil depth: 6 to 20 inches to bedrock
Rock fragments: 0 to 15 percent pebbles, 0 to 15 percent channers, 0 to 5 percent cobble or flagstone

A horizon:
Hue: 7.5YR or 10YR
Value: 5 to 7 dry, 3 to 5 moist
Chroma: 3 or 4, dry or moist

C horizons:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 4 or 5 moist
Chroma: 3 to 6, dry or moist
Texture: sandy loam, fine sandy loam

Vosburg Series

The Vosburg series consists of very deep, well drained soils that formed in alluvium from sandstone and shale and are on valley sides and fans. Slope is 2 to 8 percent. Elevation is 7,000 to 7,500 feet. The mean annual precipitation is 14 to 16 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 100 to 130 days.

Typical pedon of Vosburg in an area of Vosburg-Millpaw complex, 2 to 8 percent slopes; Rio Arriba County, New Mexico; located about 2,200 feet north and 600 feet east of the southwest corner of Sec. 20, T. 29 N, R. 3 W.; Canyon Leandro Canyon USGS quad; lat. 36 degrees 42 minutes 33 seconds N. and long. 107 degrees 10 minutes 50 seconds W., NAD 27.

A—0 to 3 inches; brown (10YR 5/3) fine sandy loam, dark brown (7.5YR 3/2) moist; single grain; loose, very friable, slightly sticky and slightly plastic; many very fine and fine roots; slightly acid (pH 6.1); clear smooth boundary.

BA—3 to 9 inches; brown (7.5YR 4/3) sandy clay loam, dark brown (7.5YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few fine tubular pores; neutral (pH 7.0); clear smooth boundary.

Bt—9 to 25 inches; brown (10YR 5/3) sandy clay loam, dark brown (7.5YR 3/2) moist; weak fine subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; few faint clay films on faces of peds and clay bridges between sand grains; neutral (pH 7.2); clear smooth boundary.

Btk1—25 to 35 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; common faint clay films on faces of peds; slightly effervescent; few fine seams of calcium carbonate on faces of peds and in pores; slightly alkaline (pH 7.5); clear smooth boundary.

Btk2—35 to 56 inches; brown (10YR 4/3) sandy clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; common faint clay films on faces of peds; strongly effervescent; many fine seams of calcium carbonate on faces of peds and in pores; slightly alkaline (pH 7.5); clear smooth boundary.

Btk3—56 to 80 inches; brown (7.5YR 5/3) sandy clay loam, brown (7.5YR 4/3) moist; weak fine subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine tubular pores; common faint clay films on faces of peds; strongly effervescent; common fine seams of calcium carbonate on faces of peds and in pores; slightly alkaline (pH 7.7).

Range in Characteristics

Secondary calcium carbonate accumulation: zone from 25 to 85 inches

A and BA horizons:
Hue: 7.5YR or 10YR
Value: 4 or 5 dry, 2 or 3 moist
Chroma: 2 or 3 dry, 2 or 3 moist
Texture: sandy clay loam, sandy loam, clay loam

Bt horizon:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 2 or 3 moist

Chroma: 2 to 4 dry, 2 or 3 moist
Texture: sandy clay loam, clay loam

Btk horizons:
Hue: 7.5YR or 10YR
Value: 4 to 6 dry, 3 or 4 moist
Chroma: 2 to 4 dry, 2 or 3 moist
Texture: sandy clay loam, clay loam

Wilmac Series

The Wilmac series consists of moderately deep, well drained soils that formed in alluvium and residuum derived from shale. Wilmac soils are on shale hills. Slope is 1 to 10 percent. Elevation is 6,900 to 7,700 feet. The mean annual precipitation is 14 to 17 inches. The mean annual air temperature is 45 to 48 degrees F, and the frost-free period is 90 to 130 days.

Typical pedon of Wilmac loam, in an area of Wilmac-Hosta-Millpaw complex, 1 to 10 percent slopes, Rio Arriba County, New Mexico, about 1 mile northwest of the town of Brazos; located about 1,530 feet east and 2,250 feet south of the northwest corner of Sec. 36, T. 30 N., R. 3 E.; Brazos USGS quad; lat. 36 degrees 46 minutes 38 seconds N. and long. 106 degrees 34 minutes 23 seconds W., NAD 27.

A—0 to 3 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly effervescent, slightly alkaline (pH 7.6); clear smooth boundary.

Bt—3 to 16 inches; brown (10YR 5/3) clay loam, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine, fine, and medium roots; common very fine tubular pores; common distinct clay films on faces of peds; strongly effervescent, slightly alkaline (pH 7.8); clear smooth boundary.

Btk—16 to 38 inches; light brownish gray (10YR 6/2) clay loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine, fine, and medium roots; common very fine tubular pores; common distinct clay films on faces of peds; common fine segregated carbonate filaments, strongly effervescent; 3 percent subangular shale gravels; moderately alkaline (pH 8.2); clear smooth boundary.

Cr—38 inches; soft shale; strongly effervescent.

Range in Characteristics

Depth to paralithic contact: 20 to 40 inches
Depth to secondary calcium carbonate: 9 to 23 inches
Particle-size control section (weighted average):
Clay content: 35 to 45 percent
Sand content: 20 to 50 percent
Rock fragments: 0 to 5 percent

A horizon:
Value: 4 or 5 dry, 3 or 4 moist
Chroma: 2 or 3, dry or moist
Clay content: 15 to 25 percent
Rock fragments: 0 to 5 percent
  Content: 0 to 5 percent
  Size: gravel
  Kind: subrounded siltstone
  Content: 0 to 5 percent
  Size: cobble
  Kind: rounded metamorphic (old riverwash)
Soil reaction: neutral to slightly alkaline

Bt horizon:
Value: 4 to 6, dry or moist
Chroma: 2 to 4, dry or moist
Texture: clay loam or clay
Clay content: 35 to 45 percent
Rock fragments: 0 to 5 percent
  Size: pebbles
  Kind: subrounded shale and siltstone
  Calcium carbonate equivalent: 0 to 5 percent
Soil reaction: neutral to slightly alkaline

Btk horizon:
Value: 4 to 7, dry or moist
Chroma: 2 or 3, dry or moist
Texture: clay loam or clay
Clay content: 35 to 45 percent
Rock fragments:
  Content: 0 to 5
  Size: gravel
  Kind: subangular shale and siltstone
  Calcium carbonate equivalent: 0 to 10 percent
  EC (mmhos/cm): 0 to 2
  Gypsum: 0 to 5 percent
  SAR: 0 to 5
Soil reaction: slightly to moderately alkaline

Zau Series

The Zau series consists of moderately deep, well-drained soils that formed in alluvium and residuum derived from sandstone and shale. The Zau soils are on cuestas and mesas. Slope is 3 to 15 percent. Elevation is 7,500 to 8,650 feet. The mean annual precipitation is 16 to 20 inches. The mean annual air temperature is 42 to 45 degrees F, and the frost-free period is 80 to 100 days.

Typical pedon of Zau loam, in an area of Zau-

Lomapedro loams, 1 to 15 percent slopes; Rio Arriba County, New Mexico, located about 2,180 feet west and 1,680 feet south of the northeast corner of Sec. 11, T. 30 N., R. 1 E.; Horse Lake USGS quad; lat. 36 degrees 49 minutes 47 seconds N. and long. 106 degrees 47 minutes 43 seconds W., NAD 27.

A1—0 to 11 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, few medium roots; few fine pores; neutral (pH 6.6); clear smooth boundary.

A2—11 to 13 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; medium fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine, few medium roots; common very fine pores; neutral (pH 6.6); 2 percent sandstone gravels; clear smooth boundary.

Bt1—13 to 16 inches; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; medium fine subangular blocky structure; hard, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; common very fine pores; few faint clay films on faces of peds; neutral (pH 6.6); 2 percent sandstone gravels; clear smooth boundary.

Bt2—16 to 21 inches; yellowish brown (10YR 5/4) clay, brown (10YR 4/3) moist; moderate medium prismatic parting to moderate medium subangular blocky; very hard, very firm, moderately sticky and moderately plastic; common very fine, fine, and few medium and course roots; common very fine pores; many distinct clay films on faces of peds; neutral (pH 7.0); less than 2 percent sandstone gravels; clear smooth boundary.

Crt—21 to 34 inches; weathered sandstone; soil material between the fractured rock; light yellowish brown (10YR 6/4) clay loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; very hard, firm, moderately sticky and moderately plastic; few very fine, fine, medium, and coarse roots; very few very fine pores; few faint clay films on rock fractures; neutral (pH 7.0); clear wavy boundary.

Cr—34 to 48 inches: weathered sandstone.

Range in Characteristics

Depth to paralithic contact: 21 to 40 inches

A horizons:
Value: 3 to 5 dry, 2 to 4 moist
Chroma: 2 or 3, dry or moist
Texture: very fine sandy loam, loam

Bt horizons:
Hue: 10YR to 7.5YR
Value: 5 or 6 dry, 3 to 5 moist
Texture: clay, clay loam, loam
Clay content: averages 35 to 50 percent

Formation of the Soils

Soil is a natural, three-dimensional body on the earth's surface that supports plants. Although the soil mantle varies widely in many places, all soils have some things in common. They all consist of mineral, organic matter, living organisms, water, and air, which occur in varying amounts in different soils.

Soil results from the action of soil-forming processes on materials deposited or accumulated by geological processes. The characteristics of the soil at any given point are determined by five factors: (1) the physical and mineralogical composition of the parent material, (2) the climate under which the soil material accumulated and has existed since accumulation, (3) the plant and animal life on and in the soil, (4) the topography, or lay of the land, and (5) the length of time that the forces of soil formation have acted on the parent material (Jenny, 1980). These factors of soil formation are interdependent, and few generalizations can be made regarding any one factor unless the effects of the others are known (Gile, et. al., 1965).

In this section, processes of soil formation and the soil-forming factors are discussed separately. The factors of climate, topography, parent material, and time are then grouped together and discussed further under the heading "Geomorphic Surfaces and Soil Development."

Processes of Soil Formation

Processes of soil formation include physical, chemical, and biological processes by which distinctive layers, or soil horizons, form in the upper two meters of parent material. These include physical and chemical weathering, leaching (eluviation), accumulation of organic matter, clay movement, oxidation-reduction, shrink-swell, and salt accumulation.

Physical and chemical weathering are the processes whereby rock is transformed into soil. Leaching, or eluviation, is the process by which materials are leached out of a horizon by percolating water. Water dissolves soluble materials, such as salts and carbonates, and transports them from one part of the soil to another. Leaching depth of salts and carbonates increases with average annual precipitation. Hydrogen ions of the organic acid solution tend to replace the base cations of calcium, magnesium, sodium, and potassium and leach them down through the soil layers.

Accumulation of organic matter occurs as plants grow in soils. Forest soils tend to have thin, organic surfaces enriched mainly by leaf fall. Grasses contribute organic matter through a fibrous root system and tend to produce thick surface soils enriched mainly by organic matter.

Clay movement occurs as particles are also translocated with water from the surface into the subsoil.

Oxidation-reduction is a chemical process associated with color changes and mottled patterns from well-aerated soils to waterlogged soils.

Shrink-swell occurs with seasonal wetting and drying of clay minerals. Clays that have high shrink-swell properties cause problems for farming, road construction, and building foundations.

Salt accumulation occurs in arid areas where evapotranspiration exceeds precipitation. It also may occur in areas where the water table is near the surface.

These zones of leaching, accumulation, and other processes define pedogenic soil horizons and determine how the soil is classified.

Factors of Soil Formation

Parent Material

Parent material is the unconsolidated material in which the soil forms. It may have weathered in place from rock, or it may have been transported by water, wind, or ice. A complex geologic history, ranging from the formation of sedimentary rocks while great seas covered the North American continent, to volcanism and mountain building processes, provided a diversity of soil parent materials in the survey area. The chemical, mineralogical, and textural attributes of these rock formations correlate with the resulting soil properties (Jenny, 1941). Parent materials include residuum, colluvium, eolian material, and alluvium.

Minor amounts of slump occur on north-facing aspects and at higher elevations.

Residuum is material which weathers from rock and is subject to soil-forming processes in place. Soils that formed in these non-transported materials have mineralogical, chemical, and textural traits that are directly related to the rock from which the material is derived. Examples of these soils are the Menefee, Skyute, and Vessilla soils that formed in residuum from shale and sandstone with minor amounts of slope alluvium.

Colluvium is material that is transported by gravity a relatively short distance downslope. Soils that formed in these materials may have a range of particle sizes from boulders and stones to clay derived from the rock above. In this survey area, the Haplustepts soils formed in colluvium derived dominantly from sandstone, the Haplustalfs soils formed in older colluvium from sandstone and shale, and the Abreu family soils formed in colluvial material from andesite. The Ustorthents soils are in areas of active colluvial and erosional slopes.

Eolian, or wind-blown materials, begin as particles on the surface of other soils and are transported and redeposited to comprise a new soil. The Pinavetes and Royosa soils occur on stabilized dunes. The Elpedro soil formed in loess, or silt-sized wind-transported materials.

Alluvium is material which has been transported and deposited by flowing water. Alluvium is rarely derived from one rock type, and its sediments generally are mineralogically diversified and sorted according to texture. It is deposited in layers, which are often well defined and contrasting in texture, color, and organic matter content. Recent deposits of alluvium are found along the Navajo River, Largo Wash, and their tributaries. Soils such as the Dula, Kwakina, Sparank, Sparham, and Tapicito formed in these deposits and display well-defined layering. Older alluvium provided parent materials of the Dulcepeak, Herm, and Lomapedro soils. Soil-forming processes have obliterated most of the evidence of layering in these soils.

Minor areas (less than 5 acres in size) of slump, or mass movement of saturated soil downslope, occur on steep north aspects along Indian Reservation Route J3 and on Archuleta Mesa. The slumps were probably caused by drifting snow and the resulting excess spring moisture in some years.

Many soils in the Jicarilla Apache Nation area formed in more than one kind of parent material. The Archmesa, Horselake, Ishkoten, and Wilmac soils formed in slope alluvium overlying residual bedrock material.

Chemical characteristics of the parent materials influence soil chemistry, native fertility, and plant composition. The Animas Formation contains readily weatherable feldspars, contributing to higher nutrient levels and plant productivity. This formation yields the most productive commercial pine soil parent material on the Jicarilla. Conversely, Mancos shale contributes to a soil chemistry that inhibits pine regeneration and favors grass under the current climatic conditions.

Climate

Climate, past and present, has a profound and continuing effect on soil formation. Heat and moisture control the kinds and amounts of organisms that inhabit the area (Cook and Warren 1973). These factors affect the accumulation of organic matter, the type and rate of weathering of the soil mineral constituents, and the development of diagnostic soil features.

Whether water availability results in a water surplus or a water deficit depends on the climate. Water is necessary for the growth of plants and soil organisms that contribute organic matter to the soil. Availability of water determines the rate of plant production and in turn affects the organic matter content and processes in the soil.

Climate is the primary modifier of the rate at which weathering occurs. Agents of physical weathering, such as ice, water, and wind, cause rocks to disintegrate. Chemical weathering occurs through the processes of hydrolysis, hydration, acidification, oxidation, and dissolution, which cause the breakdown, synthesis, and recombination of minerals (Brady, 1999). Temperature affects the rates at which weathering, decomposition of parent material, and chemical reactions occur.

Temperature is a prime factor in determining rates of production and destruction of organic matter. As plant litter decomposes, organic matter accumulates. The resulting humus enhances nutrient availability, water-holding capacity, and organic acid formation.

In this survey area, three major moisture and temperature zones influence soil genesis: the desert shrub grassland, the pinyon juniper zone, and the ponderosa pine zone. Roughly for every 5 miles of distance traveled from south to north, the average annual precipitation increases about 1 inch, and average annual air temperature decreases from about 49 to 43 degrees F. Ponderosa pine production

increases as these factors change toward the northeastern part of the survey area.

The southern part of the area is generally the driest and produces the least vegetation. The smaller amount of organic matter produced by the vegetation oxidizes rapidly, causing soils to have light-colored surface horizons, as in the Doakum and Betonnie soils. Soils in the north half receive nearly double the precipitation and have cooler mean annual air temperatures. They tend to have higher amounts of organic matter. Examples of these soils are the Cedarsprings, Jaythree, Ohwiler, and Suposo soils.

Plant and Animal Life

Plants, animals, and humans are important in soil formation. Where the temperature is suitable, plants begin to grow as soon as they receive suitable amounts of water and nutrients. Plants, including fungi, influence soil formation by returning residues to the soil and aiding in decomposition. Plants influence the temperature of the soil by providing shade during warm periods and by reducing evaporation from the soil surface. Plants provide cover that reduces erosion and stabilizes the soil surface. Ponderosa and pinyon pine trees provide duff layers that shade soil from summer sun and reduce average summer soil temperatures by 5 to 10 degrees (unpublished data, Jicarilla Soil Survey Office). Vegetation also affects the transfer of minerals within the soil, the soil pH, and, in conjunction with climate and topography, the movement of material by leaching.

Bacteria, nematodes, and other forms of animal life aid in the weathering of minerals and the decomposition of organic matter. The larger animals, such as prairie dogs, gophers, moles, ground squirrels, and reptiles, turn and mix the soil during burrowing activities.

Humans can have a strong influence on soil formation. Tillage and overgrazing may accelerate erosion. Changes in drainage conditions or topography induced by land shaping also influence the soil. Modifications in natural fertility by fertilizers, incorporation of organic residues, or cropping practices can also alter the soil-forming process.

As a rule, humans, plants, animals, insects, bacteria, and fungi affect the formation of soils by increasing the content of organic matter, producing gains or losses in plant nutrients, mixing soil layers, and changing structure and porosity.

Microbiotic crusts are composed of cyanobacteria, green and brown algae, mosses, and lichens (USDA-NRCS, 1997). These organisms and their byproducts bind soil particles together by organic materials. They provide a stabilizing influence at the soil surface by improving infiltration, increasing porosity, and by reducing runoff and erosion. They also fix nitrogen and increase nutrient levels.

Grasses and trees require somewhat different soil chemistry for growth. Trees, particularly the conifers, use less calcium and magnesium and therefore thrive better in soils from which these substances have been leached away (Strahler, 1973). Thus, soils with lower pHs tend to support woodlands, and those with higher pHs tend to support grassland. In addition, moderately fine and fine textured soils tend to support grasses because they permit shallower percolation of limited rainwater. Grasslands tend to produce thicker, darker, organically enriched surface horizons, whereas forests tend to produce thin topsoils.

Topography

Topography and runoff influence the formation of soils by affecting drainage, erosion, soil temperature, and plant cover. The thickness and the kind of soil horizons depend on the amount of water that percolates through the parent material. Steepness of slope, aspect, shape, and roughness influence the climate of a soil and the extent of erosive forces affecting a soil.

Where precipitation rates exceed infiltration rates, water runs off. Runoff water transports or erodes soil particles. Erosion potential is greatest on steep soils, and soils on slopes may develop more slowly. As organic matter accumulations and weathered soil material washes away, new soil parent material or bedrock nears the surface. Soils on gentle slopes often receive depositions of soil material, as in many valley positions of the survey area. Deposition may slow the development of soil features in arid areas, since soil material is buried before pedogenic features develop. Watersheds having fine-textured soils that formed in shale with high relief tend to have highest runoff, drainage densities, and sediment yields. Watersheds on coarse-textured soils that formed on sandstone with less relief have few drainages, less runoff, and lower sediment yields (Branson et. al., 1981).

Soil moisture availability is affected by the runoff or run-on water it sheds or receives. Knolls will have a locally drier soil climate in comparison with soils on level topography. Where excess moisture runs off uplands, lower slopes receive water and will have a more humid soil climate than soils on level topography.

The additional moisture on the Jaythree and Cedarsprings soils enhances their timber-producing potential. Soils such as the Jicarilla and Hetz receive excessive moisture from adjacent, steep slopes and may have standing water or high water tables for periods of time.

On steep slopes there is a wide difference in climate between adjacent north and south aspects. Less direct sunlight and less wind on north-facing slopes results in cooler soil temperatures and lower evapotranspiration rates than on south-facing slopes. This results in greater effective precipitation, different plant species composition, and denser vegetation. On steep south aspects, older soils which developed under a past climate are losing ground to erosion.

Time

Soils of the survey area range from very old to very young. The kind of horizons and the degree of soil formation depend in part on how long the soil has remained stable. Some upland soils are very old. Soils on floodplains and steep slopes may be very young (Kohnke, 1995). Generally, the more mature a soil becomes, the larger the number of horizons it has and the greater their thickness and intensity are (Jenny, 1941).

Geologic time may be roughly outlined for the Jicarilla as follows:

4.5 billion years before present: the formation of the earth.

65-130 million years before present: Cretaceous seas cover the North American Continent (Mancos and Lewis shale formations).

65 million years before present: Laramide orogeny, uplift of the Rocky Mountains, origin of the Animas formation, and fault zones near Dulce.

28 million years before present: intrusion of the Archuleta Mesa sill and igneous dikes near Dulce.

1 million years before present: the beginning of the ice age, downcutting of the Rio Chama.

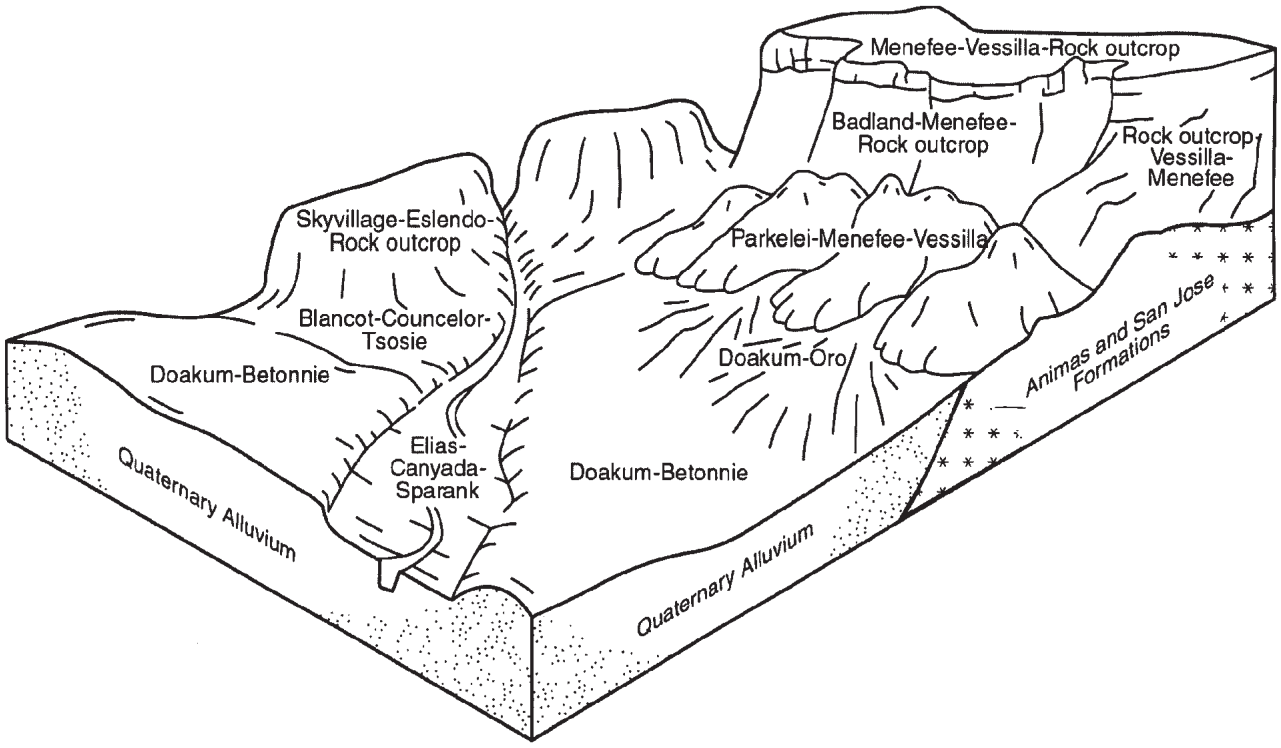

Figure 26—Conceptual diagram of the major soil and landscape positions of the Largo Plains-Tapicito Plateau transition.

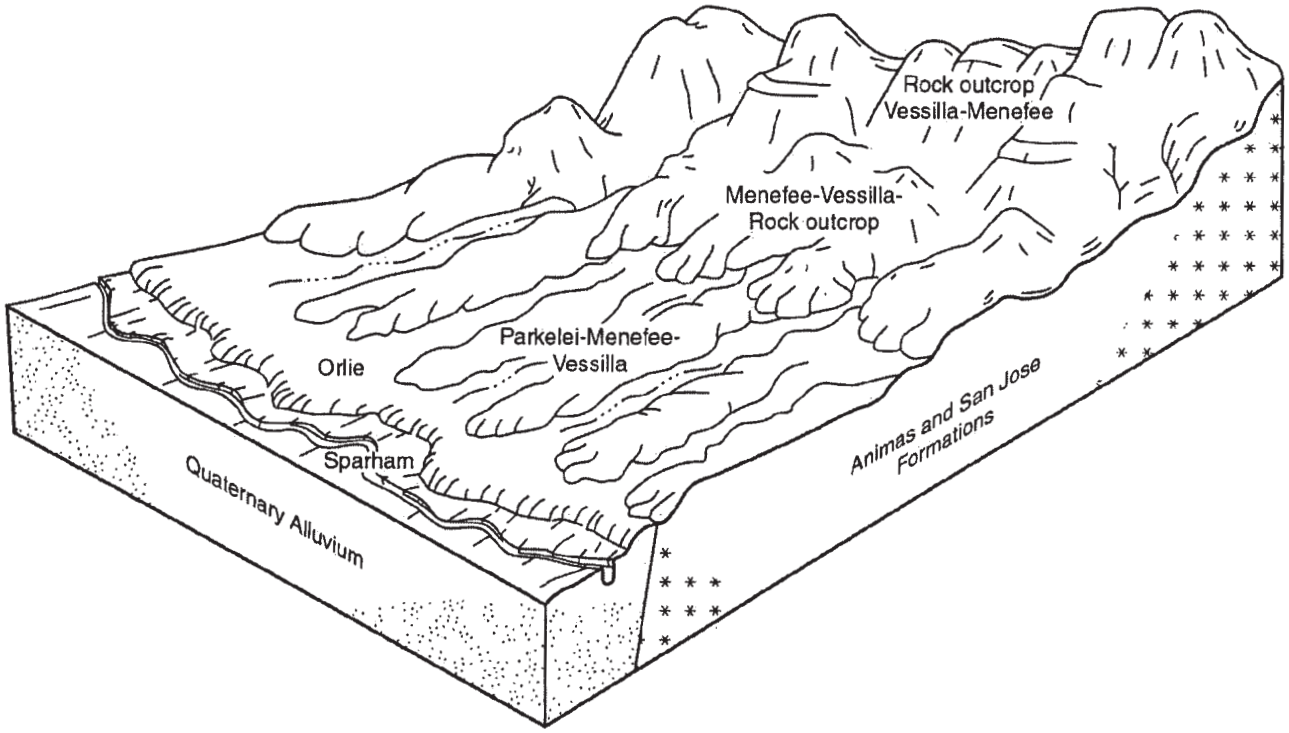

Figure 27—Conceptual diagram of the major soil and landscape positions of the Tapicito Plateau.

10,000 years before present: the most recent glaciation, cooler paleoclimate.

While the nearest glaciation to the Jicarilla probably occurred in the mountains above Chama, it is more significant that the climate that existed during the time of the ice age 10,000 years before present was cooler and therefore more effectively moist. Geologists interpret this data to mean that Quaternary climate in New Mexico was probably cooler during the last glacial episode (10,000–12,000 years ago) than today by 5 to 7 degrees C (9 to 13 degrees F). Whether the climate was wetter than today during that time has been a matter of debate (Monger and Mack, in preparation). This environment produced more forest vegetation, affecting soil development, and larger streamflows, which deposited volumes of sediment along the larger drainages of the area. These sediments formed into many of the soils important to forestry, agriculture, and community development today.

Soils in the Navajo and Chama River valleys are relatively young and show little evidence of soil processes, except for the accumulation of organic matter in the surface layer. Recent colluvial deposits on south-facing escarpments exhibit little profile development and closely resemble the original parent material from which they were derived. Older soils such as the Herm, Dulcepeak, and Lomapedro are finer in texture, have well developed argillic horizons, and have less resemblence to the parent material from which they were derived.

Geomorphic Surfaces and Soil Development

Geomorphic surfaces consist of a mappable landform or group of landforms that represent an episode of landscape development. Three ancient surfaces depict the most recent landscape development episodes and are associated with soil development today. These are the Largo Plains, the Tapicito Plateau, and the Yeguas Mesas (Baltz, 1967).

The Largo Plains in the area known as the Teepees, at the junction of Highways 537 and 550, is a broad plain dissected by Canyon Largo. This area was part of a 10-mile-wide valley that sloped northwest to the San Juan River before the San Juan carved the deep canyon through which it now flows. Terrigenous in source materials, this relatively stable surface exhibits

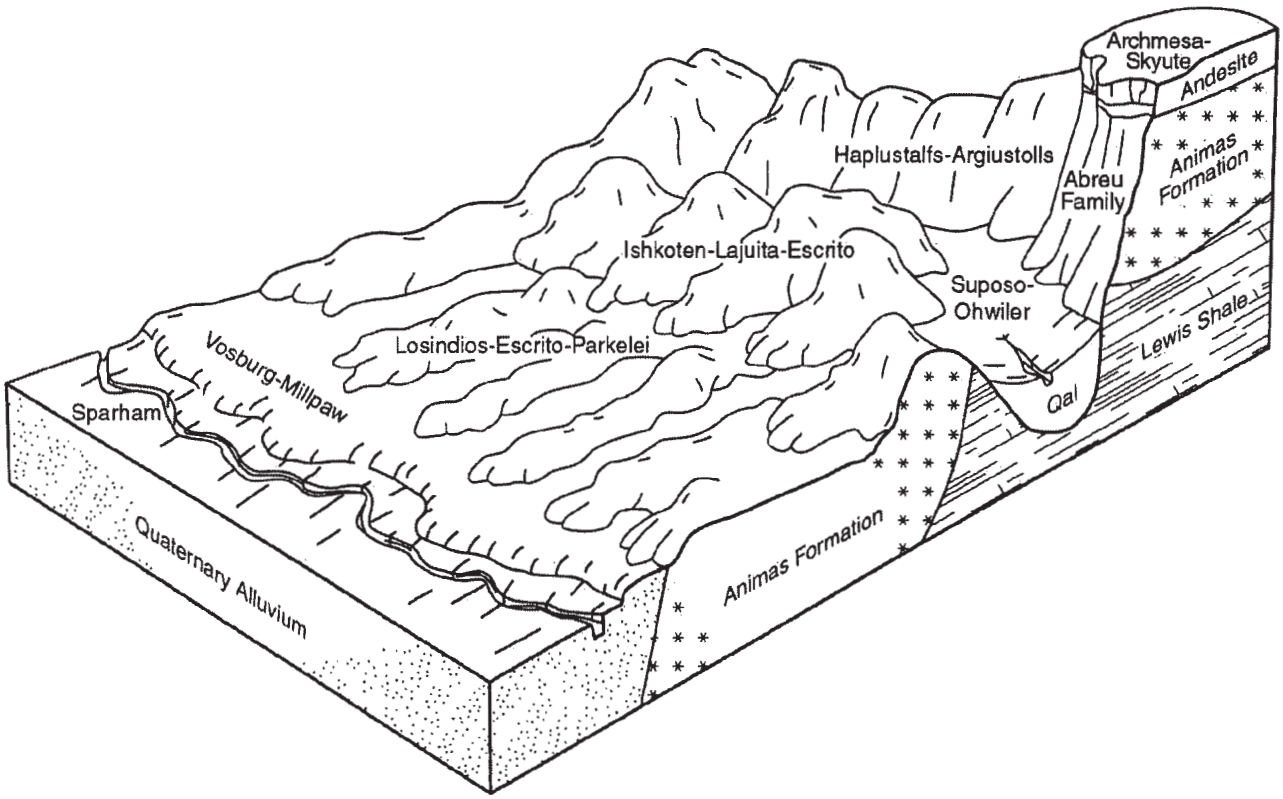

Figure 28—Conceptual diagram of the major soil and landscape positions of the Yeguas Mesas transition to the Lewis Shale landscape.

the medium-textured argillic horizon characteristic of the Doakum soil, and endured periods of drought which created dunes upon which the Betonnie, Pinavetes, and Royosa soils developed. Figure 26 shows the major soil and landscape positions of the Largo Plains below the Tapacito Plateau.

A second surface, the Tapicito Plateau, is comprised roughly of the lands which drain into Tapicito Creek and spans from Largo Plains to the Continental Divide. Figure 27 shows the major soil and landscape positions of the Tapacito Plateau. This surface today is evidenced by scattered small, remnant, relatively smooth summits associated with Honolulu and Wildhorse mesas. Soils on smooth summits and valleys are characterized by the Orlie soil, and soils on hillslopes and mesa escarpments are characterized by the Menefee and Vessilla soils. Like the Largo Plains, this area was terrigenous in origin.

A third surface, the Yeguas Mesas, are larger and taller downcut remnants of the same episode as the Tapicito Plateau. These are the high Apache, Horse Lake, and Tecolote mesas, standing as much as 1,000 feet above current valleys. Upheld by resistant sandstones of the Dakota and Mesa Verde formations, these landforms were historically dissected by west-flowing streams (Hawley et. al., 1987). Some originated in the Brazos Cliffs area and probably flowed into Canyon Largo. River cobble of the Ortega quartzite from the Brazos area is found high upon these mesas today (Lomapedro series description). Downcutting by the Rio Chama during the last three glacial advances probably cut off the west-flowing streams from the Brazos. Outwash terraces along the Rio Chama record the history of this glacial episode, which ended about 10,000 years ago. Soils on the Yeguas Mesas surfaces exhibit a moderate to high degree of development, clayey textures, and low to moderate content of rock fragments in the profile. These are the Dulcepeak, Herm, Lomapedro, and Zau soils.

The Amargo Creek, Stone Lake Valley, and east side of the Theis Ranch is formed over the Lewis and Mancos shales, which are relatively erodible geologic materials. Figure 28 shows the major soil and landscape positions of the Yeguas Mesas transition to the Lewis Shale landscape. These shales, deposited by Cretaceous seas 65 million years ago, exhibit the

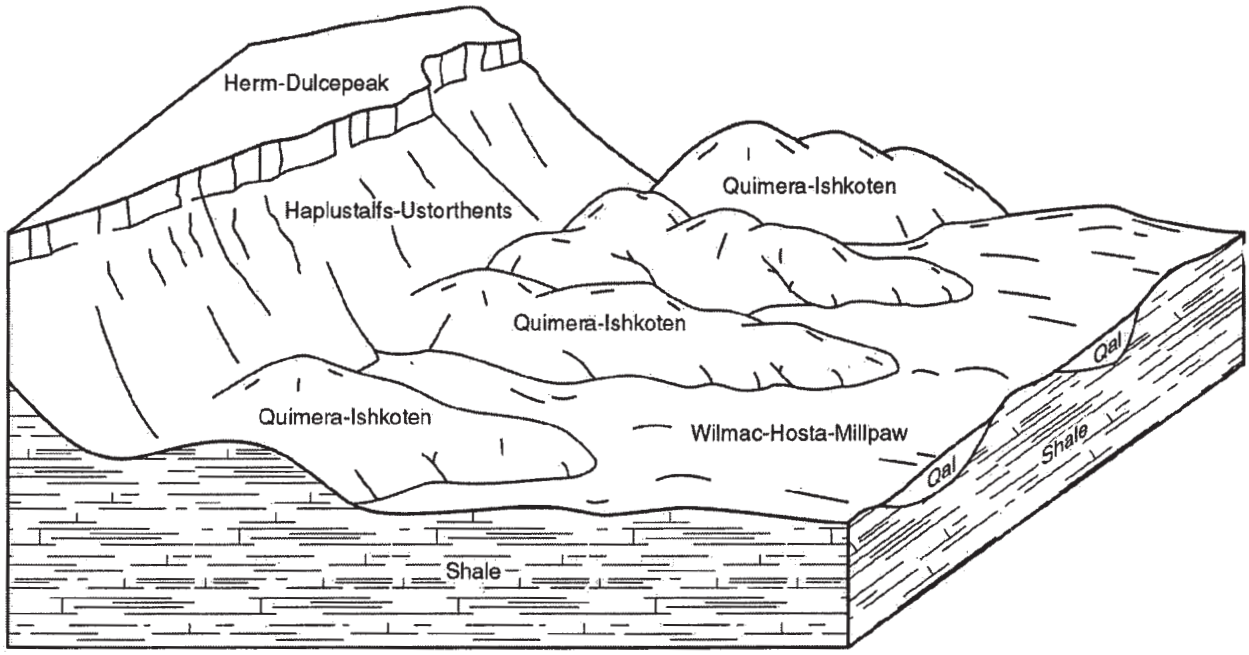

Figure 29—Conceptual diagram of the major soil and landscape positions of the north-central portion of the survey area from Archuleta Mesa south.

clayey textures, higher soil pHs, carbonate content, and occasional saline seeps common in the valley today. Old ponderosa pine stumps in the higher elevations are evidence that the climate was previously cooler and wetter. These areas currently support mostly grassland and scattered trees and shrubs.

Archuleta Mesa is constructed of a resistant andesite volcanic sill about 300 feet thick. The soils of this higher elevation environment are low in carbonates, have neutral pHs, and are well suited to ponderosa pine.

The Animas Formation dominates the transition area between the Archuleta anticlinorum and the Tapicito Plateau, which generally follows the mountains and hillslopes from the Navajo River south to Highway 550 along the Continental Divide. Figure 29 shows the major soil and landscape positions of this north-central portion of the survey area from Archuleta Mesa south.

The Animas Formation parent material is characterized by relatively low pH, high nutrient availability, and high water-holding capacity associated with weatherable potassium feldspars, smectitic clay mineralogy, and a slight influence of volcanic ash. The soils associated with this formation also commonly have higher infiltration rates because of their sandy surface and subsoil textures which favor pine forests. These materials are thought to have originated from footslope alluvium of the ancient San Juan Mountains and ash from the proximity of Shiprock.

The soil-forming factors differ throughout the Jicarilla Apache Nation area, resulting in a variety of soils on landforms which represent records of geologic history. These soils are a valuable natural resource that support a variety of land uses. Knowledge of the soils can enable us to protect and use the resource wisely.

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Glossary

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Adsorption. The process by which atoms, molecules, or ions are taken up from the soil solution or soil atmosphere and retained on the surfaces of solids by chemical or physical binding.

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.

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 gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. 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.

Andesite. A fined grained igneous rock with no quartz or orthoclase, composed of about 75 percent plagioclase feldspars, balance of ferromagnesian silicates. Widely characteristic of mountain building processes around the borders of the Pacific ocean.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

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
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

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.

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.

Basalt. Igneous rock formed by the cooling and hardening of a magma associated with volcanic activity and emplaced at or near the earth's surface.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

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.

Blowout. A shallow depression from which all or most of the soil material has been removed by the 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.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Bouldery. Surface phases of soils having boulders on the surface horizon in amounts high enough to interfere with cultivation, harvest, or trafficability. The limits for the phase classes expressed as percentage of surface covered are:

Bouldery	0.01 to 0.1
Very bouldery	0.1 to 3
Extremely bouldery	3 to 15
Rubbly	15 to 75
Rubble land	more than 75

Stones may occupy a greater proportion of the surface in these phases so long as the boulders dominate the stones as a limiting factor for use and management. Rubble land is not soil, but rather is treated as a kind of miscellaneous area.

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.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Calcic horizon. A subsoil horizon characterized by an illuvial accumulation of secondary calcium carbonate. Calcic horizons are not cemented or indurated to a degree which would be limiting to root growth.

Cambic horizon. A subsoil horizon characterized by loamy texture, soil structure rather than rock structure, and some evidence of alteration such as illuviation of clay or removal and redistribution of calcium carbonate 2E. A cambic horizon can include layers that are part of an ochric epipedon or an albic horizon.

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.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channer. A thin, flat fragment of rock such as sandstone, limestone, slate, schist, or (rarely) basalt, as much as 6 inches along the longest axis.

Channery soil material. Soil material that has, 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.

Chroma. The relative purity or strength of a spectral color. Chroma indicates the degree of saturation of neutral gray by the spectral color. (See Munsell notation)

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.

Claystone. Sedimentary rock that is formed by the hardening of a clay deposit and has an angular or irregular fracture. It is similar to shale, but lacks the platy lamination or fissility.

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.

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.

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.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 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 has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

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.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take 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 or 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 effects of 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.

Coppice dune. A small dune of fine grained soil material stabilized around shrubs or small trees.

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.

Cretaceous. The third period of the Mesozoic Era of geologic time (from approximately 135 to 65 million years ago).

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.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cryptogam. The association of certain species of spore-producing plants which grow on or directly under the soil surface in arid, semiarid, and subhumid areas. These plants produce algal filaments, fungal mycelia, and exudates, that firmly bind and cement soil separates into a dark, lumpy crust. These crusts stabilize the surfaces of many sandy, saline, and gypsiferous soils which helps protect them from erosion. Cryptogam crusts are easily damaged by excessive foot, hoof, or wheel traffic.

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.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

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.

Depth class, soil. Generally, the thickness of the soil over root-limiting layers such as bedrock or a pan. Very deep soils are more than 60 inches deep over bedrock or a pan; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

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.

Dike. An intrusive, tabular body of igneous rock that cuts across the structure of adjacent rocks or cuts massive rocks.

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.

Dome. A smoothly rounded landform or rock mass such as the rock-capped summit of a mountain.

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.

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.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological 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 ecological sites in kind and/or proportion of species or in total production.

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.

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.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

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.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry 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. 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 firefighters and equipment. Designated roads also serve as firebreaks.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has 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.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A

footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

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.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Formation (stratigraphy). The basic rock-stratigraphic unit in the local classification of rocks. A body of rock (commonly a sedimentary stratum or strata, but also igneous and metamorphic rocks) generally characterized by some degree of internal lithologic homogeneity or distinctive lithologic features (such as chemical composition, structures, textures, or general kind of fossils), by a prevailing (but not necessarily tabular shape), and by mappability at the earth's surface (at scales of the order of 1:25,000) or traceability in the subsurface. Formations may be combined into groups or subdivided into members.

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.

Geomorphic surface. A mappable area of the earth's surface that has a common history; the area is of similar age and is formed by a set of processes during an episode of landscape evolution. A geomorphic surface can be erosional, constructional, or both. The surface shape can be planar, concave, convex, or any combination of these.

Geomorphology. The science of landforms that treats the general configuration of the earth's surface; especially the study of the classification, description, nature, origin, and development of landforms and their relationships to underlying structures, and of the history of geologic changes as recorded by these surface features. The term is especially applied to the genetic interpretation of landforms.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Gleyed soil material. Soil horizons that formed under saturation with stagnant water, resulting in the reduction of iron and other elements. Gleyed horizons have low chroma and gray matrix colors.

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 has 15 to 35 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 the 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.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hazard of soil blowing. A narrative term describing the potential of soil surfaces, in cultivated or bare disturbed areas, to blow during periods of strong sustained winds. The soil properties used to determine soil blowing hazard are soil texture, organic matter content, calcium carbonate reaction, rock fragment content, and aggregate stability. *Wind erodibility index (I value)* is intended to represent most of the above permanent properties.

Head out. To form a flower head.

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 second 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. An explanation of the subdivisions is given in the "Soil Survey Manual." 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.

Hue. The property of color that is perceived by the eye and measured on the Munsell color system. The Munsell system is based on five principal hues: red (R), yellow (Y), green (G), blue (B), and purple (P). Five intermediate hues representing midpoints between each pair of principal hues complete the 10 major hue names used to describe the notation. The most common intermediate hues in soil are yellow-red (YR) green-yellow (GY), and blue-green (BG). (See Munsell notation.)

Hydric soil. A soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic (oxygen-depleted) conditions in the upper part. Hydric soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

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.

Hydrophytic vegetation. Plant life growing in water or on a substrate (usually soil) that is at least periodically deficient in oxygen as a result of excessive water content.

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.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the 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 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.

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 0.1	very slow
0.1 to 0.3	slow
0.3 to 0.5	moderately slow
0.5 to 0.75	moderate
0.75 to 1.0	moderately rapid
1.0 to 1.5	rapid
More than 1.5	very rapid

Interdunes. The relatively flat surface, whether sand-free or sand-covered, between dunes.

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued

contributions from melting snow or other surface and shallow subsurface sources.

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.

Jurassic. The second period of the Mesozoic Era of geologic time (from approximately 195 to 135 million years ago).

Knoll. A small, low, rounded hill rising above adjacent landforms.

K-sat. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landform. Any physical, recognizable form or feature on the earth's surface, having a characteristic shape and range in composition, and produced by natural causes. Landforms include a wide range in size and provide an empirical description of similar portions of the earth's surface.

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.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at 1/3 or 1/10 bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

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.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Marine. A term pertaining to an open ocean or inland sea, and to oceanic conditions in the present or geologic past.

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.

Matrix, soil. The dominant volume, in a soil horizon, which is continuous in appearance and envelops microsites.

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.

Mesa. A broad, nearly flat-topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

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.

Microrelief. (i) Generically refers to local, slight irregularities in form and height of a land surface that are superimposed upon a larger landform, including such features as low mounds, swales, and shallow pits. See also gilgai, shrub-coppice dune, tree-tip mound, tree-tip pit. (ii) Slight variations in the height of a land surface that are too small to delineate on a topographic or soils map at commonly-used map scales (e.g. 1:24,000 and 1:15,840).

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 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.

Monocline. A unit of folded strata that flexes from the horizontal in one direction only, and is not part of an anticline or syncline. This structure is typically present in plateau areas where nearly flat strata locally assume steep dips caused by differential vertical movements without faulting.

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.

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 indicates a color that has 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 of 6.6 to 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.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

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.

Ochric epipedon. A surface horizon that is generally thin, dry, light in color, high in value or chroma, and/or low in organic matter. Ochric epipedons include eluvial horizons (such as albic horizons) that are at or near the soil surface.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

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.

Pararock. Rock fragments which are soft, within the extremely weakly to moderately cemented rupture resistance classes, and do not slake in water within 24 hours. (Schoeneberger et. al, 1998). Commonly, these materials are partially weathered or weakly consolidated sandstone, siltstone, or shale.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedogenesis. The term used to connote soil formation. Pedogenic processes, as opposed to geologic processes, are those which involve the soil forming factors in the development and differentiation of soils and their horizons.

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 movement of water through the soil.

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	0.0 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.)

Piping. Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plain. A general term referring to any flat, lowland area, large or small, at a low elevation. Specifically, any extensive region of comparatively smooth and level gently undulating land.

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 first epoch of the Quaternary Period of geologic time, following the Tertiary Pliocene Epoch and 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.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

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.

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.

Quaternary. The second period of the Cenozoic Era of geologic time, extending from the end of the Tertiary Period (about 2 million years ago) to the present, and comprising two epochs, the Pleistocene (Ice Age) and Holocene (Recent).

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.

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.

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.

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	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.

Reduction. The gain of one or more electrons by an ion or molecule. The degree of reduction in a soil can be characterized by a direct measurement of oxidation-reduction (redox) potentials. A degree of reduction that results in the transformation of ferric iron (Fe III) to ferrous iron (Fe II) is used to define the characteristic of aquic conditions.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

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 generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riparian. A term pertaining to plants and animals living on, or adjacent to, the bank or flood plain of an intermittent stream or perennial river.

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.

Rooting depth. Effective depth of soil which is not restrictive to roots. (See Potential rooting depth)

Root zone. The part of the soil that can be penetrated by plant roots.

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 seep. A small area where saline soil water percolates slowly to the land surface (USDA-NRCS, 1993).

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline-sodic soil. A soil that contains both soluble salts and exchangeable sodium in amounts that interfere with the growth of most crop plants. The conductivity of the saturation extract is more than 4 mmhos/cm, and the exchangeable sodium percentage is more than 15 percent (sodium adsorption ratio of 13 or more). Saline-sodic soils typically do not have the poor physical properties characteristic of sodic soils.

Salinity. The degree to which a soil is affected by soluble salts dissolved in water. Salinity is expressed as the electrical conductivity of a saturated extract in millimhos per centimeter (mmhos/cm). The degrees of salinity and their respective electrical conductivity values are:

Nonsaline	less than 2
Very slightly saline	2 to 4
Slightly saline	4 to 8
Moderately saline	8 to 16
Strongly saline	more than 16

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.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

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.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Scarp. An escarpment, cliff, or steep slope of some extent along the margin of a plateau, mesa, terrace or structural bench.

Scarp slope. The relatively steeper face of a cuesta, facing in a direction opposite to the dip of the strata.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

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.

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.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. 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.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silicate. A compound or mineral that contains silica and a metallic or organic radical. Silicates are the most common soil and rock-forming minerals and constitute over 90 percent of the earth's crust. Most soil clays belong to a class of silicate minerals known as phyllosilicates, which are characterized by having platy cleavage.

Sill. An intrusive body of igneous rock of approximately uniform thickness and relatively thin compared with its lateral extent, which has been emplaced parallel to the bedding of the intruded rocks.

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.

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.

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.

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.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slope alluvium. Sediment gradually transported on mountain or hill slopes primarily by alluvial processes and characterized by particle sorting. Sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Sodic soil. A soil that contains exchangeable sodium in amounts that interfere with the growth of most crop plants. Sodic soils have more than 15 percent exchangeable sodium (sodium adsorption ratio of 13 or more) and are also strongly or very strongly alkaline (pH 8.5 or higher). They restrict plant growth due to the poor physical condition of the soil caused by the dispersal of clay particles.

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:

Nonsodic	less than 5:1
Slightly sodic	5-13:1
Moderately sodic	13-30:1
Strongly sodic	More than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

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 morphology. (i) The physical constitution of a soil profile as exhibited by the kinds, thickness, and arrangement of the horizons in the profile, and by the texture, structure, consistence, and porosity of each horizon. (ii) The visible characteristics of the soil or any of its parts.

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.

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. Surface phases of soils having stones on the

surface horizon in amounts high enough to interfere with cultivation, harvest, or trafficability. The limits for the phase classes expressed as percent of surface covered are:

Stony	0.01 to 0.1
Very stony	0.1 to 3
Extremely stony	3 to 15
Rubbly	15 to 75
Rubble land	more than 75

Rubble land is not soil, but rather is treated as a kind of miscellaneous area.

Stratified. Arranged in strata, or layers. The term refers to either soil or geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream, and representing the dissected remnants of an abandoned flood plain, stream bed, or valley floor produced during a former stage of erosion and deposition. Older and higher stream terraces have a relatively flat summit surface (tread), built by stream deposition, and a steep descending slope (riser), graded to a lower base level of erosion.

Strength limitation (in tables). The soil is not strong enough to support loads when moist.

Structure, rock. The primary arrangement of minerals, small particles, and rock fragments which is inherited from the parent material. As opposed to soil structure, rock structure is not formed by the processes of soil formation. Included in the concept of rock structure are the fine stratifications in alluvium and the fissile or angular arrangement of soft rock fragments in some C horizons formed in residuum derived from sedimentary bedrock.

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 grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

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. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

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.

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 generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrigenous. Geologic materials which were derived from the land or a continent; *antonym,* marine.

Tertiary. The first period of the Cenozoic Era of geologic time (from approximately 65 to 2 million years ago).

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."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topography. The relative position and elevations of the natural or manmade features of an area that describe the configuration of its surface.

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.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread. A geomorphic component of terraces and flood-plain steps consisting of the flat to gently sloping, topmost and laterally extensive slope. Commonly a recurring part of a series of natural, step-like landforms such as successive stream terraces. Its characteristic shape and alluvial sediment composition are derived from the cut and fill processes of a fluvial system.

Triassic. The first period of the Mesozoic Era of geologic time (from approximately 230 to 195 million years ago).

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Valley floor. A general term for the nearly level to gently sloping, bottom surface of a valley. Component landforms include axial stream channels, the flood plain, and in some areas, low stream terraces that may be subject to flooding from tributary streams. (See Wash, Flood plain, and Stream terrace)

Value. The degree of lightness or darkness of a color in relation to a neutral gray scale. (See Munsell notation)

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Wash. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

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.

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 ovendry 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.

Tables

Table 1.--Temperature and Precipitation

TAPS Station : CHAMA, NM1664
Start yr. - 1961 End yr. - 1990
Temperature: 30 years available out of 30 requested in this analysis
Precipitation: 30 years available out of 30 requested in this analysis

	Temperature (degrees F.)						Precipitation (inches)				
Month	avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	36.6	4.9	20.8	52	-22	0	1.77	0.53	2.77	4	22.2
February	40.4	9.1	24.8	56	-18	0	1.61	0.63	2.43	4	19.4
March	45.9	15.9	30.9	64	-8	10	2.01	0.96	2.92	5	19.4
April	56.0	23.2	39.6	72	2	76	1.27	0.46	1.95	3	6.2
May	65.5	30.8	48.2	79	14	262	1.15	0.43	1.75	3	1.0
June	76.1	38.1	57.1	88	24	505	1.12	0.33	1.83	3	0.0
July	80.6	45.9	63.3	90	34	716	2.24	1.23	3.13	6	0.0
August	77.4	44.7	61.1	87	33	649	2.82	1.88	3.67	7	0.0
September	70.9	37.5	54.2	84	21	427	2.23	1.04	3.26	5	0.2
October	61.2	27.8	44.5	76	8	175	1.96	0.72	3.12	4	3.8
November	47.0	17.5	32.2	65	-7	13	1.72	0.86	2.57	4	12.2
December	38.3	8.6	23.5	55	-18	0	1.78	0.73	2.79	5	21.1
Yearly :											
Average	58.0	25.3	41.7	---	---	---	----	----	----	---	---
Extreme	92	-30	---	90	-25	---	----	----	----	---	---
Total	---	---	---	---	---	2833	21.69	17.27	25.68	53	105.6

Average number of days per year with at least 1 inch of snow on the ground: 105

Table 1.--Temperature and Precipitation--continued

TAPS Station : DULCE, NM2608
Start yr. - 1961 End yr. - 1990
Temperature: 30 years available out of 30 requested in this analysis
Precipitation: 30 years available out of 30 requested in this analysis

Month	Temperature (degrees F.) avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	Precipitation (inches) avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	39.7	4.6	22.2	56	-26	0	1.35	0.48	2.08	3	13.4
February	44.6	10.9	27.8	61	-17	2	1.22	0.40	1.89	4	12.3
March	51.0	18.3	34.7	70	-6	22	1.63	0.75	2.39	4	8.4
April	61.3	23.8	42.6	77	8	121	1.00	0.60	1.49	3	1.3
May	70.0	30.7	50.4	84	16	325	1.20	0.47	1.89	3	0.0
June	80.0	37.3	58.6	92	24	553	0.77	0.20	1.32	2	0.0
July	84.3	46.5	65.4	94	32	779	1.85	0.93	2.64	4	0.0
August	81.7	46.1	63.9	91	32	738	2.57	1.21	3.75	6	0.0
September	74.8	37.4	56.1	87	21	480	1.84	0.78	2.73	4	0.0
October	65.2	27.0	46.1	79	11	202	1.60	0.39	2.65	4	1.2
November	50.8	17.8	34.3	69	-5	19	1.35	0.53	2.05	4	5.1
December	41.2	8.3	24.8	59	-22	0	1.51	0.44	2.38	4	14.9
Yearly :											
Average	62.1	25.7	43.9	---	---	---	----	----	----	---	---
Extreme	97	-47	---	94	-30	---	----	----	----	---	---
Total	---	---	---	---	---	3240	17.89	14.42	20.89	45	56.5

Average number of days per year with at least 1 inch of snow on the ground: 58

Table 1.--Temperature and Precipitation--continued

TAPS Station : EL VADO DAM, NM2837
Start yr. - 1961 End yr. - 1990
Temperature: 30 years available out of 30 requested in this analysis
Precipitation: 30 years available out of 30 requested in this analysis

	Temperature (Degrees F.)						Precipitation (Inches)				
				2 yrs in 10				2 yrs in 10		avg	
				will have		avg		will have		# of	avg
Month	avg daily max	avg daily min	avg	max temp. >than	min temp. <than	# of grow deg days*	avg	less than	more than	days w/.1 or more	total snow fall
January	38.8	3.6	21.2	56	-27	0	0.94	0.38	1.42	3	12.7
February	43.7	11.4	27.5	61	-18	4	0.82	0.36	1.21	3	9.6
March	49.6	20.0	34.8	69	-4	31	1.06	0.47	1.57	3	7.4
April	59.6	25.6	42.6	76	9	133	0.78	0.34	1.15	2	1.4
May	69.4	32.7	51.0	84	17	347	1.02	0.38	1.68	3	0.3
June	80.1	39.9	60.0	93	27	599	0.87	0.26	1.36	2	0.0
July	84.9	48.3	66.6	94	35	825	1.95	0.99	2.78	5	0.0
August	81.4	47.2	64.3	91	34	753	2.71	1.49	3.78	7	0.0
September	74.7	38.6	56.6	88	22	499	1.72	0.70	2.58	4	0.0
October	65.0	27.6	46.3	81	12	216	1.32	0.40	2.15	3	0.9
November	51.0	18.6	34.8	71	-2	27	1.01	0.41	1.58	3	5.3
December	41.1	9.3	25.2	59	-19	1	0.94	0.30	1.52	3	11.5
Yearly :											
Average	61.6	26.9	44.3	---	---	---	----	----	----	---	---
Extreme	97	-45	---	94	-30	---	----	----	----	---	---
Total	---	---	---	---	---	3436	15.13	12.35	17.73	41	49.2

Average number of days per year with at least 1 inch of snow on the ground: 71

Table 1.--Temperature and Precipitation--continued

TAPS Station : LYBROOK, NM5290
Start yr. - 1961 End yr. - 1990
Temperature: 29 years available out of 30 requested in this analysis
Precipitation: 29 years available out of 30 requested in this analysis

Month	Temperature (degrees F.) avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	Precipitation (inches) avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	37.7	13.4	25.5	56	-13	1	0.57	0.12	0.97	2	6.8
February	42.0	18.6	30.3	61	-5	9	0.68	0.33	1.05	2	7.0
March	50.1	24.8	37.5	68	4	59	0.70	0.17	1.21	2	5.0
April	59.0	31.7	45.4	76	13	188	0.35	0.13	0.68	1	1.0
May	69.6	39.8	54.7	85	20	420	0.49	0.20	1.01	1	0.0
June	80.4	49.8	65.1	93	31	718	0.48	0.12	1.08	1	0.0
July	84.4	55.4	69.9	94	45	891	1.29	0.39	2.02	3	0.0
August	81.0	53.4	67.2	91	41	793	1.99	1.05	2.95	4	0.0
September	73.5	46.2	59.8	86	30	583	1.39	0.57	2.09	3	0.0
October	63.0	36.0	49.5	78	17	291	1.04	0.22	1.95	3	0.8
November	49.4	24.9	37.2	67	7	54	0.79	0.36	1.34	2	2.8
December	39.2	16.1	27.6	58	-9	2	0.74	0.19	1.24	2	7.6
Yearly :											
Average	60.8	34.2	47.5	---	---	---	----	----	----	---	---
Extreme	99	-28	---	95	-15	---	----	----	----	---	---
Total	---	---	---	---	---	4011	10.52	4.88	13.02	26	31.0

Average number of days per year with at least 1 inch of snow on the ground: 21

Table 1.--Temperature and Precipitation--continued

TAPS Station : TIERRA AMARILLA 4 N, NM8845
Start yr. - 1961 End yr. - 1990
Temperature: 29 years available out of 30 requested in this analysis
Precipitation: 30 years available out of 30 requested in this analysis

	Temperature (Degrees F.)						Precipitation (Inches)				
Month	avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	37.4	3.3	20.4	53	-27	0	0.93	0.36	1.42	3	9.9
February	42.2	9.4	25.8	57	-19	1	1.00	0.33	1.55	3	10.0
March	48.9	17.9	33.4	68	-6	19	1.06	0.47	1.58	3	8.2
April	59.3	24.4	41.9	75	5	107	0.79	0.36	1.22	2	1.7
May	68.9	31.5	50.2	82	16	316	0.87	0.38	1.35	2	0.2
June	78.3	38.4	58.4	90	25	543	0.77	0.26	1.24	3	0.0
July	82.7	46.4	64.6	92	34	751	2.11	1.26	2.87	6	0.0
August	79.8	45.5	62.6	90	34	678	2.67	1.47	3.74	7	0.0
September	72.9	37.9	55.4	86	22	457	1.93	0.88	2.84	5	0.0
October	63.6	28.0	45.8	79	11	190	1.38	0.55	2.27	3	1.3
November	49.1	17.7	33.4	68	-8	15	1.09	0.53	1.76	3	6.4
December	39.3	7.9	23.6	56	-20	0	0.98	0.31	1.53	2	10.7
Yearly :											
Average	60.2	25.7	43.0	---	---	---	----	----	----	---	---
Extreme	95	-39	---	93	-28	---	----	----	----	---	---
Total	---	---	---	---	---	3078	15.60	9.45	18.21	42	48.5

Average number of days per year with at least 1 inch of snow on the ground: 65

*A growing degree day is a unit of heat available for plant growth.
It can be calculated by adding the maximum and minumum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 40.0 deg. F)

Table 2.--Freeze Dates in Spring and Fall

FROST Station : CHAMA, NM1664

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30

Spring:
  Years of missing data 24 deg = 1, 28 deg = 1, 32 deg = 0
  Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
  Data years used 24 deg = 29, 28 deg = 29, 32 deg = 30
Fall:
  Years of missing data 24 deg = 0, 28 deg = 0, 32 deg = 0
  Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
  Data years used 24 deg = 30, 28 deg = 30, 32 deg = 30

	Temperature		
Probability	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	June 7	June 23	July 4
2 year in 10 later than--	June 1	June 17	June 28
5 year in 10 later than--	May 21	June 6	June 18
First freezing temperature in fall:			
1 yr in 10 earlier than--	September 17	September 7	August 25
2 yr in 10 earlier than--	September 23	September 13	August 30
5 yr in 10 earlier than--	October 5	September 24	September 10

Table 2.--Freeze Dates in Spring and Fall--continued

FROST Station : DULCE, NM2608

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30

Spring:
Years of missing data 24 deg = 4, 28 deg = 3, 32 deg = 2
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 26, 28 deg = 27, 32 deg = 28
Fall:
Years of missing data 24 deg = 0, 28 deg = 0, 32 deg = 0
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 30, 28 deg = 30, 32 deg = 30

	Temperature		
Probability	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	June 8	June 24	July 12
2 year in 10 later than--	June 2	June 18	July 6
5 year in 10 later than--	May 22	June 5	June 26
First freezing temperature in fall:			
1 yr in 10 earlier than--	September 16	September 6	August 23
2 yr in 10 earlier than--	September 22	September 11	August 29
5 yr in 10 earlier than--	October 2	September 21	September 10

Table 2.--Freeze Dates in Spring and Fall--continued

FROST Station : EL VADO DAM, NM2837

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30

Spring:
  Years of missing data 24 deg = 1, 28 deg = 1, 32 deg = 1
  Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
  Data years used 24 deg = 29, 28 deg = 29, 32 deg = 29
Fall:
  Years of missing data 24 deg = 0, 28 deg = 0, 32 deg = 0
  Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
  Data years used 24 deg = 30, 28 deg = 30, 32 deg = 30

	Temperature		
Probability	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 26	June 17	June 30
2 year in 10 later than--	May 22	June 11	June 25
5 year in 10 later than--	May 14	May 31	June 15
First freezing temperature in fall:			
1 yr in 10 earlier than--	September 19	September 9	August 29
2 yr in 10 earlier than--	September 24	September 13	September 4
5 yr in 10 earlier than--	October 4	September 22	September 14

Table 2.--Freeze Dates in Spring and Fall--continued

FROST Station : LYBROOK, NM5290

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30

Spring:
Years of missing data 24 deg = 6, 28 deg = 6, 32 deg = 6
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 24, 28 deg = 24, 32 deg = 24
Fall:
Years of missing data 24 deg = 9, 28 deg = 8, 32 deg = 8
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 21, 28 deg = 22, 32 deg = 22

	Temperature		
Probability	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 17	May 29	June 7
2 year in 10 later than--	May 9	May 21	June 1
5 year in 10 later than--	April 24	May 6	May 19
First freezing temperature in fall:			
1 yr in 10 earlier than--	October 11	September 22	September 15
2 yr in 10 earlier than--	October 17	September 29	September 22
5 yr in 10 earlier than--	October 27	October 14	October 5

Table 2.--Freeze Dates in Spring and Fall--continued

FROST Station : TIERRA AMARILLA 4 N, NM8845

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30

Spring:
Years of missing data 24 deg = 6, 28 deg = 4, 32 deg = 3
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 24, 28 deg = 26, 32 deg = 27
Fall:
Years of missing data 24 deg = 7, 28 deg = 7, 32 deg = 5
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 23, 28 deg = 23, 32 deg = 25

	Temperature		
Probability	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	June 3	June 20	July 2
2 year in 10 later than--	May 28	June 13	June 26
5 year in 10 later than--	May 17	June 1	June 15
First freezing temperature in fall:			
1 yr in 10 earlier than--	September 20	September 7	August 25
2 yr in 10 earlier than--	September 26	September 13	August 31
5 yr in 10 earlier than--	October 7	September 22	September 12

Table 3.--Growing Season

GROWTH Station : CHAMA, NM1664

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30
Years with missing data 24 deg = 1, 28 deg = 1, 32 deg = 0
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 29, 28 deg = 29, 32 deg = 30

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	107	87	59
8 years in 10	116	94	68
5 years in 10	135	108	84
2 years in 10	153	123	100
1 year in 10	163	130	109

GROWTH Station : DULCE, NM2608

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30
Years with missing data 24 deg = 4, 28 deg = 3, 32 deg = 2
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 26, 28 deg = 27, 32 deg = 28

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	107	84	49
8 years in 10	116	92	58
5 years in 10	133	108	76
2 years in 10	149	124	94
1 year in 10	158	132	103

Table 3. Growing Season--continued

GROWTH Station : EL VADO DAM, NM2837

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30
Years with missing data 24 deg = 1, 28 deg = 1, 32 deg = 1
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 29, 28 deg = 29, 32 deg = 29

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	123	89	67
8 years in 10	129	97	75
5 years in 10	141	113	91
2 years in 10	153	129	107
1 year in 10	159	137	115

GROWTH Station : LYBROOK, NM5290

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30
Years with missing data 24 deg = 12, 28 deg = 11, 32 deg = 11
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 18, 28 deg = 19, 32 deg = 19

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	151	126	105
8 years in 10	162	137	116
5 years in 10	184	157	138
2 years in 10	206	178	161
1 year in 10	218	189	172

Table 3. Growing Season--continued

GROWTH Station : TIERRA AMARILLA 4 N, NM8845

Start yr. - 1961 End yr. - 1990
Requested years of data: 30 Available years of data: 30
Years with missing data 24 deg = 8, 28 deg = 8, 32 deg = 6
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 22, 28 deg = 22, 32 deg = 24

	Daily Minimum Temperature		
Probability	# days > 24°F	# days > 28°F	# days > 32°F
9 years in 10	117	88	63
8 years in 10	126	97	72
5 years in 10	143	114	90
2 years in 10	160	132	107
1 year in 10	169	141	117

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Rio Arriba County	Sandoval County	Total	
				Area	Extent
		Acres	Acres	Acres	Pct
5	Water	2,145	66	2,211	0.3
6	Miscellaneous water	12	---	12	*
10	Elias-Canyada-Sparank complex, saline, sodic, 0 to 3 percent slopes	11,546	12,646	24,192	2.9
13	Doakum-Betonnie fine sandy loams, 0 to 8 percent slopes	21,172	16,917	38,089	4.5
18	Sparham clay, 0 to 3 percent slopes	790	173	963	0.1
19	Sparham silt loam, 0 to 3 percent slopes	0	1,468	1,468	0.2
20	Menefee-Vessilla-Rock outcrop complex, 5 to 35 percent slopes	29,911	4,919	34,830	4.2
21	Badland-Menefee-Rock outcrop complex, 35 to 65 percent slopes	10,730	1,178	11,908	1.4
23	Teromote silty clay loam, 1 to 3 percent slopes	120	760	880	0.1
24	Orlie-Sparham association, 0 to 5 percent slopes	2,272	7,965	10,237	1.2
32	Doakum very fine sandy loam, 1 to 6 percent slopes	12,170	4,803	16,973	2.0
40	Parkelei-Menefee-Vessilla complex, 2 to 20 percent slopes	60,753	32,568	93,321	11.1
64	Dula loam, 0 to 2 percent slopes	856	---	856	0.1
69	Pinavetes-Florita complex, 2 to 10 percent slopes	2,489	1,519	4,008	0.5
70	Blancot-Councelor-Tsosie complex, 0 to 5 percent slopes	14,499	2,851	17,350	2.1
104	Doakum-Oro complex, 0 to 5 percent slopes	5,940	10,155	16,095	1.9
105	Badland-Menefee complex, 15 to 35 percent slopes	655	2,097	2,752	0.3
107	Berryman-Ruson association, 1 to 8 percent slopes	763	---	763	*
108	Peney-Ransect association, 1 to 20 percent slopes	969	---	969	0.1
115	Menefee channery loam, 2 to 35 percent slopes	6,558	238	6,796	0.8
119	Roques-Nusmag clay loams, 1 to 8 percent slopes	1,027	---	1,027	0.1
136	Elpedro silt loam, 1 to 5 percent slopes	1,486	---	1,486	0.2
155	Vessilla-Menefee-Orlie complex, 1 to 30 percent slopes	10,392	10,226	20,618	2.5
156	Lindrith-Royosa complex, 2 to 7 percent slopes	3,347	5,522	8,869	1.1
214	Quimera-Ishkoten complex, 10 to 35 percent slopes	6,172	---	6,172	0.7
220	Skyvillage-Eslendo-Rock outcrop complex, 3 to 35 percent slopes	5,525	1,996	7,521	0.9
229	Nusmag-Tottles clay loams, 0 to 3 percent slopes	85	---	85	*
231	Sparham clay loam, saline, sodic, 0 to 3 percent slopes	6,373	2,042	8,415	1.0
303	Orlie loam, 0 to 8 percent slopes	16,481	2,963	19,444	2.3
304	Orlie-Nalivag loams, 2 to 8 percent slopes	16,100	3,544	19,644	2.3
310	Rock outcrop-Vessilla-Menefee complex, 15 to 45 percent slopes	49,317	186	49,503	5.9
340	Riverwash-Kwakina-Tapicito complex, 0 to 3 percent slopes	2,558	54	2,612	0.3
350	Hosta loam, 1 to 5 percent slopes	5,556	285	5,841	0.7
370	Orlie fine sandy loam, 1 to 8 percent slopes	14,780	3,974	18,754	2.2

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Rio Arriba County	Sandoval County	Total	
				Area	Extent
		Acres	Acres	Acres	Pct
380	Teequee-Menefee-Vessilla complex, 5 to 40 percent slopes	15,716	---	15,716	1.9
390	Losindios-Escrito-Parkelei complex, 3 to 25 percent slopes	51,450	1,939	53,389	6.4
403	Vosburg-Millpaw complex, 2 to 8 percent slopes	27,062	---	27,062	3.2
421	Argiustolls-Ustorthents-Rock outcrop association, 35 to 65 percent slopes	4,038	---	4,038	0.5
430	Wilmac-Hosta complex, dry, 2 to 8 percent slopes	5,791	---	5,791	0.7
440	Losindios-Jaythree complex, 3 to 15 percent slopes	13,163	---	13,163	1.6
452	Gojiya silty clay, 0 to 3 percent slopes	1,305	---	1,305	0.2
500	Escrito-Rock outcrop-Dulcepeak complex, 1 to 15 percent slopes	21,783	---	21,783	2.6
501	Zau-Lomapedro loams, 1 to 15 percent slopes	11,126	---	11,126	1.3
515	Ustorthents-Rock outcrop complex, 35 to 80 percent slopes	2,280	---	2,280	0.3
523	Suposo-Ohwiler loams, 1 to 10 percent slopes	10,437	---	10,437	1.2
524	Jicarilla-Ohwiler association, 1 to 8 percent slopes	8,653	---	8,653	1.0
525	Jaythree-Cedarsprings complex, 3 to 15 percent slopes	6,579	---	6,579	0.8
526	Hetz clay loam, 0 to 3 percent slopes	287	---	287	*
530	Wilmac-Hosta-Millpaw complex, 1 to 10 percent slopes	19,063	---	19,063	2.3
531	Horselake-Menefee complex, 3 to 25 percent slopes	13,696	---	13,696	1.6
533	Badland	59	---	59	*
540	Ishkoten-Lajuita-Escrito complex, 15 to 60 percent slopes	64,930	---	64,930	7.8
541	Ishkoten-Lajuita complex, north aspect, 15 to 60 percent slopes	16,500	---	16,500	2.0
552	Haplustalfs-Argiustolls complex, 25 to 70 percent slopes	10,682	---	10,682	1.3
553	Haplustalfs-Ustorthents complex, 25 to 70 percent slopes	34,663	---	34,663	4.1
560	Herm-Dulcepeak complex, 3 to 25 percent slopes	11,704	---	11,704	1.4
571	Orlie-Cementlake complex, 1 to 6 percent slopes	18,741	3,602	22,343	2.7
580	Archmesa-Skyute complex, 1 to 25 percent slopes	594	---	594	*
590	Abreu family-Rubbleland-Rock outcrop complex, 35 to 80 percent slopes	420	---	420	*
600	Haplustepts-Haplustalfs complex, 35 to 75 percent slopes	6,228	---	6,228	0.7
	Total	700,499	136,656	837,155	100.0

* Less than 0.1 percent.

Table 5.--Rangeland Productivity

(Only the soils that support rangeland vegetation suitable for grazing are rated.)

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
10:				
Elias	Salt Flats	1,000	700	400
Canyada	Salt Flats	1,000	700	400
Sparank	Salt Flats	1,000	700	400
13:				
Doakum	Loamy	800	500	300
Betonnie	Sandy	900	600	300
18:				
Sparham	Clayey	1,200	900	600
19:				
Sparham	Clayey	1,200	900	600
23:				
Teromote	Swale	1,100	850	600
24:				
Orlie	Loamy	1,100	850	600
Sparham	Clayey	1,200	900	600
32:				
Doakum	Loamy	800	500	300
40:				
Parkelei	Loamy	1100	850	600
Menefee	---	---	---	---
Vessilla	---	---	---	---
64:				
Dula	Mountain Meadows	3,500	2,950	2,400
69:				
Pinavetes	Sandy	900	600	300
Florita	Loamy	800	500	300
70:				
Blancot	Loamy	800	500	300
Councelor	Sandy	900	600	300
Tsosie	Salt Flats	1,000	700	400
104:				
Doakum	Loamy	800	500	300
Oro	Clayey	700	500	300

Table 5.--Rangeland Productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
107:				
Berryman	Clayey	1,200	900	600
Ruson	Swale	1,700	1,300	800
119:				
Roques	Mountain Valley	2,000	1,400	1,000
Nusmag	Mountain Meadows	3,500	3,000	2,400
136:				
Elpedro	Loamy	1,100	850	600
155:				
Vessilla	---	---	---	---
Menefee	---	---	---	---
Orlie	Loamy	1,100	850	600
156:				
Lindrith	Loamy	1,100	850	600
Royosa	Sandy	900	700	500
214:				
Quimera	Mountain Shale	1.200	900	600
Ishkoten	---	---	---	---
229:				
Nusmag	Mountain Meadows	3,500	3,000	2,400
Tottles	Mountain Meadows	3,500	2,950	2,400
231:				
Sparham	Salty Bottomland	1,500	1,050	600
303:				
Orlie	Loamy	1,100	850	600
304:				
Orlie	Loamy	1,100	850	600
Nalivag	Loamy	1,100	850	600
340:				
Riverwash	---	---	---	---
Kwakina	Sandy	900	600	300
Tapicito	Loamy	800	500	300
350:				
Hosta	Loamy	1,100	850	600

Table 5.--Rangeland Productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
370:				
Orlie	Loamy	1,100	850	600
403:				
Vosburg	Loamy	1,100	850	600
Millpaw	Clayey	1,200	900	600
430:				
Wilmac, dry	Loamy	1,100	850	600
Hosta	Loamy	1,100	850	600
452:				
Gojiya	Salt Meadow	2,000	1,600	1,200
501:				
Zau	Mountain Slopes	900	700	500
Lomapedro	Mountain Slopes	900	700	500
523:				
Suposo	Mountain Loam	1,400	1,100	900
Ohwiler	Mountain Loam	1,400	1,100	900
524:				
Jicarilla	Mountain Meadows	3,500	2,950	2,400
Ohwiler	Mountain Loam	1,400	1,100	900
526:				
Hetz	Mountain Meadows	3,500	2,950	2,400
530:				
Wilmac	Mountain Slopes	900	700	500
Hosta	Mountain Slopes	900	700	500
Millpaw	Mountain Loam	1,400	1,100	900
531:				
Horselake	Mountain Shale	1,200	900	600
Menefee	---	---	---	---
571:				
Orlie	Loamy	1,100	850	600
Cementlake	Salty Bottomland	1,500	1,050	600

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
5:						
Water---	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
6:						
Miscellaneous Water---	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
10:						
Elias---	Salt Flats	Favorable	1000	alkali sacaton		25
		Normal	700	galleta		15
		Unfavorable	400	Indian ricegrass		5
				blue grama		5
				western wheatgrass		5
				threeawn		3
				other annual grasses		2
				thinleaf fourwing saltbush		10
				greasewood		5
				shadscale saltbush		5
				broom snakeweed		3
				winterfat		3
				other shrubs		4
				tansymustard		3
				whorled plantain		3
				cuman ragweed		2
				other annual forbs		2
Canyada---	Salt Flats	Favorable	1000	alkali sacaton		25
		Normal	700	galleta		15
		Unfavorable	400	Indian ricegrass		5
				blue grama		5
				western wheatgrass		5
				threeawn		3
				other annual grasses		2
				thinleaf fourwing saltbush		10
				greasewood		5
				shadscale saltbush		5
				broom snakeweed		3
				winterfat		3
				other shrubs		4
				tansymustard		3
				whorled plantain		3
				cuman ragweed		2
				other annual forbs		2

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
10:						
Sparank-------	Salt Flats	Favorable	1000	alkali sacaton		25
		Normal	700	galleta		15
		Unfavorable	400	Indian ricegrass		5
				blue grama		5
				western wheatgrass		5
				threeawn		3
				other annual grasses		2
				thinleaf fourwing saltbush		10
				greasewood		5
				shadscale saltbush		5
				broom snakeweed		3
				winterfat		3
				other shrubs		4
				tansymustard		3
				whorled plantain		3
				cuman ragweed		2
				other annual forbs		2
13:						
Betonnie------	Sandy	Favorable	900	Indian ricegrass		20
		Normal	600	dropseed		5
		Unfavorable	300	galleta		10
				blue grama		5
				needleandthread		5
				poverty threeawn		5
				bottlebrush squirreltail		5
				other perennial grasses		5
				big sagebrush		4
				winterfat		4
				thinleaf fourwing saltbush		4
				Mormon tea		4
				broom snakeweed		2
				soapweed yucca		2
				other shrubs		4
				tansymustard		2
				buckwheat		2
				other perennial forbs		2
Doakum--------	Loamy	Favorable	800	Indian ricegrass		20
		Normal	500	galleta		15
		Unfavorable	300	blue grama		15
				bottlebrush squirreltail		5
				sand dropseed		5
				western wheatgrass		5
				other annual grasses		5
				big sagebrush		5
				thinleaf fourwing saltbush		5
				other shrubs		5
				scarlet globemallow		3
				groundsel		2
				cuman ragweed		1
				aster		1
				penstemon		1
				other perennial forbs		7

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
18:						
Sparham-------	Clayey	Favorable	1200	western wheatgrass		20
		Normal	900	alkali sacaton		15
		Unfavorable	600	bottlebrush squirreltail		10
				prairie junegrass		5
				other perennial grasses		10
				other shrubs		10
				other perennial forbs		10
19:						
Sparham-------	Clayey	Favorable	1200	western wheatgrass		20
		Normal	900	alkali sacaton		15
		Unfavorable	600	bottlebrush squirreltail		10
				prairie junegrass		5
				other perennial grasses		10
				other shrubs		10
				other perennial forbs		10
20:						
Menefee-------	---	Favorable	---	blue grama	20	
		Normal	---	Indian ricegrass	12	
		Unfavorable	---	galleta	5	
				western wheatgrass	5	
				bottlebrush squirreltail	8	
				other annual grasses	5	
				antelope bitterbrush	10	
				true mountain mahogany	5	
				big sagebrush	8	
				Gambel's oak	6	
				other shrubs	5	
				yucca	6	
				pricklypear	3	
				other annual forbs	4	
Vessilla------	---	Favorable	---	blue grama	25	
		Normal	---	Indian ricegrass	15	
		Unfavorable	---	galleta	10	
				bottlebrush squirreltail	6	
				Kentucky bluegrass	7	
				other annual grasses	3	
				antelope bitterbrush	7	
				big sagebrush	5	
				pingue hymenoxys	4	
				broom snakeweed	3	
				other shrubs	2	
				pricklypear	7	
				yucca	2	
				other annual forbs	2	
Rock Outcrop--	---	Favorable	---			
		Normal	---			
		Unfavorable	---			

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
21:						
Badland-------	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
Menefee-------	---	Favorable	---	Indian ricegrass	20	
		Normal	---	blue grama	15	
		Unfavorable	---	galleta	10	
				bottlebrush squirreltail	6	
				western wheatgrass	3	
				Kentucky bluegrass	2	
				other annual grasses	4	
				true mountain mahogany	10	
				black sagebrush	5	
				longflower rabbitbrush	4	
				broom snakeweed	4	
				big sagebrush	3	
				other shrubs	2	
				yucca	2	
				pricklypear	2	
				other annual forbs	3	
Rock Outcrop--	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
23:						
Teromote------	Swale	Favorable	1100	western wheatgrass		35
		Normal	850	alkali sacaton		10
		Unfavorable	600	bottlebrush squirreltail		5
				other perennial grasses		15
				big sagebrush		10
				other perennial forbs		5
24:						
Orlie---------	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				prairie sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
24:						
Sparham	Clayey	Favorable	1200	western wheatgrass		25
		Normal	900	alkali sacaton		20
		Unfavorable	600	bottlebrush squirreltail		7
				galleta		6
				blue grama		5
				prairie junegrass		4
				muttongrass		4
				spike muhly		3
				other perennial grasses		5
				big sagebrush		5
				fourwing saltbush		3
				winterfat		2
				rabbitbrush		1
				other shrubs		2
				prairie sagewort		2
				buckwheat		2
				globemallow		2
				other annual forbs		2
32:						
Doakum	Loamy	Favorable	800	Indian ricegrass		20
		Normal	500	galleta		15
		Unfavorable	300	blue grama		15
				bottlebrush squirreltail		5
				sand dropseed		5
				western wheatgrass		5
				other annual grasses		5
				big sagebrush		5
				thinleaf fourwing saltbush		5
				other shrubs		5
				scarlet globemallow		3
				groundsel		2
				cuman ragweed		1
				aster		1
				penstemon		1
				other perennial forbs		7
40:						
Parkelei	Loamy	Favorable	1100	blue grama	25	
		Normal	850	Indian ricegrass	10	
		Unfavorable	600	bottlebrush squirreltail	6	
				prairie junegrass	6	
				Arizona fescue	5	
				bluegrass	5	
				western wheatgrass	3	
				galleta	3	
				other annual grasses	3	
				oneseed juniper	10	
				big sagebrush	5	
				pingue hymenoxys	3	
				antelope bitterbrush	2	
				Gambel's oak	2	
				other shrubs	2	
				pricklypear	4	
				yucca	2	
				lupine	1	
				other annual forbs	3	

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
40:						
Menefee	---	Favorable	---	blue grama	20	
		Normal	---	Indian ricegrass	12	
		Unfavorable	---	galleta	5	
				western wheatgrass	5	
				bottlebrush squirreltail	8	
				other annual grasses	5	
				antelope bitterbrush	10	
				true mountain mahogany	5	
				big sagebrush	8	
				Gambel's oak	6	
				other shrubs	5	
				yucca	6	
				pricklypear	3	
				other annual forbs	4	
Vessilla	---	Favorable	---	blue grama	25	
		Normal	---	prairie junegrass	15	
		Unfavorable	---	Indian ricegrass	10	
				bottlebrush squirreltail	7	
				elk sedge	7	
				other annual grasses	5	
				pingue hymenoxys	7	
				big sagebrush	6	
				mountain big sagebrush	2	
				antelope bitterbrush	2	
				other shrubs	2	
				pricklypear	5	
				yucca	2	
				other annual forbs	8	
64:						
Dula	Mountain Meadows	Favorable	3500	tufted hairgrass		25
		Normal	2950	sedge		20
		Unfavorable	2400	mountain brome		10
				sheep fescue		7
				western wheatgrass		7
				redtop		5
				rush		5
				Kentucky bluegrass		5
				Columbia needlegrass		3
				other annual grasses		2
				shrubby cinquefoil		3
				other shrubs		2
				Rocky Mountain iris		2
				clover		2
				other annual forbs		2

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
69:						
Pinavetes-----	Sandy	Favorable	900	Indian ricegrass		20
		Normal	600	dropseed		15
		Unfavorable	300	galleta		10
				blue grama		5
				needleandthread		5
				poverty threeawn		5
				bottlebrush squirreltail		5
				other perennial grasses		5
				big sagebrush		4
				winterfat		4
				thinleaf fourwing saltbush		4
				Mormon tea		4
				broom snakeweed		2
				soapweed yucca		2
				other shrubs		4
				tansymustard		2
				buckwheat		2
				other perennial forbs		2
Florita-------	Loamy	Favorable	800	Indian ricegrass		20
		Normal	500	galleta		15
		Unfavorable	300	blue grama		15
				bottlebrush squirreltail		5
				sand dropseed		5
				western wheatgrass		5
				other annual grasses		5
				big sagebrush		5
				thinleaf fourwing saltbush		5
				other shrubs		5
				scarlet globemallow		3
				groundsel		2
				cuman ragweed		1
				aster		1
				penstemon		1
				other perennial forbs		7
70:						
Blancot-------	Loamy	Favorable	800	Indian ricegrass		20
		Normal	500	galleta		15
		Unfavorable	300	blue grama		15
				bottlebrush squirreltail		5
				sand dropseed		5
				western wheatgrass		5
				other annual grasses		5
				big sagebrush		5
				thinleaf fourwing saltbush		5
				other shrubs		5
				scarlet globemallow		3
				groundsel		2
				cuman ragweed		1
				aster		1
				penstemon		1
				other perennial forbs		7

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
70:						
Councelor-----	Sandy	Favorable	900	Indian ricegrass		20
		Normal	600	dropseed		15
		Unfavorable	300	galleta		10
				blue grama		5
				needleandthread		5
				poverty threeawn		5
				bottlebrush squirreltail		5
				other perennial grasses		5
				big sagebrush		4
				winterfat		4
				thinleaf fourwing saltbush		4
				Mormon tea		4
				broom snakeweed		2
				soapweed yucca		2
				other shrubs		4
				tansymustard		2
				buckwheat		2
				other perennial forbs		2
Tsosie--------	Salt Flats	Favorable	1000	alkali sacaton		25
		Normal	700	galleta		15
		Unfavorable	400	Indian ricegrass		5
				blue grama		5
				western wheatgrass		5
				threeawn		3
				other annual grasses		2
				thinleaf fourwing saltbush		10
				greasewood		5
				shadscale saltbush		5
				broom snakeweed		3
				winterfat		3
				other shrubs		4
				tansymustard		3
				whorled plantain		3
				cuman ragweed		2
				other annual forbs		2
104:						
Doakum--------	Loamy	Favorable	800	Indian ricegrass		20
		Normal	500	galleta		15
		Unfavorable	300	blue grama		15
				bottlebrush squirreltail		5
				sand dropseed		5
				western wheatgrass		5
				other annual grasses		5
				big sagebrush		5
				thinleaf fourwing saltbush		5
				other shrubs		5
				scarlet globemallow		3
				groundsel		2
				cuman ragweed		1
				aster		1
				penstemon		1
				other perennial forbs		7

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
104:						
Oro	Clayey	Favorable	700	galleta		20
		Normal	500	alkali sacaton		15
		Unfavorable	300	blue grama		10
				Indian ricegrass		5
				western wheatgrass		5
				bottlebrush squirreltail		3
				spike dropseed		3
				needleandthread		2
				New Mexico Feathergrass		2
				other annual grasses		3
				big sagebrush		6
				thinleaf fourwing saltbush		5
				broom snakeweed		3
				winterfat		3
				green rabbitbrush		2
				other shrubs		3
				groundsel		2
				cuman ragweed		2
				milkvetch		2
				whorled plantain		1
				other annual forbs		3
105:						
Badland	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
Menefee	---	Favorable	---	galleta	10	
		Normal		blue grama	10	
		Unfavorable		sideoats grama	5	
				big sagebrush	5	
				Gambel's oak	5	
107:						
Berryman	Clayey	Favorable	1200	western wheatgrass		20
		Normal	900	alkali sacaton		15
		Unfavorable	600	blue grama		5
				bottlebrush squirreltail		10
				little bluestem		5
				muttongrass		5
				prairie junegrass		5
				spike muhly		5
				big sagebrush		5
				mountain big sagebrush		5
				winterfat		5
				other shrubs		10
				other perennial forbs		10
Ruson	Swale	Favorable	1700	western wheatgrass		35
		Normal	1300	alkali sacaton		10
		Unfavorable	800	blue grama		5
				bottlebrush squirreltail		5
				other perennial grasses		15
				big sagebrush		10
				mountain big sagebrush		5
				other perennial forbs		5

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
108:						
Peney	---	Favorable	---	prairie junegrass	10	
		Normal	---	Indian ricegrass	5	
		Unfavorable	---	pinyon ricegrass	5	
				Columbia needlegrass	5	
				Rocky Mountain juniper	15	
				twoneedle pinyon	15	
				Gambel's oak	10	
				mountain mahogany	5	
				other perennial forbs	5	
Ransect	---	Favorable	---	prairie junegrass	10	
		Normal	---	Indian ricegrass	5	
		Unfavorable	---	bottlebrush squirreltail	5	
				pinyon ricegrass	5	
				Gambel's oak	10	
				mountain mahogany	5	
115:						
Menefee	---	Favorable	---	blue grama	10	
		Normal	---	galleta	10	
		Unfavorable	---	sideoats grama	5	
				big sagebrush	5	
				Gambel's oak	5	
119:						
Roques	Mountain Valley	Favorable	2000	western wheatgrass		20
		Normal	1400	prairie junegrass		10
		Unfavorable	1000	spike muhly		10
				sedge		5
				shrubby cinquefoil		5
				Rocky Mountain iris		10
Nusmag	Mountain Meadows	Favorable	3500	tufted hairgrass		25
		Normal	3000	bluegrass		10
		Unfavorable	2400	sedge		10
				western wheatgrass		5
				reedgrass		5
				Rocky Mountain iris		5
				shrubby cinquefoil		5
				clover		5
				other perennial forbs		10

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
136:						
Elpedro	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3
155:						
Vessilla	---	Favorable	---	blue grama	25	
		Normal	---	Indian ricegrass	20	
		Unfavorable	---	galleta	10	
				bottlebrush squirreltail	8	
				sand dropseed	7	
				other annual grasses	3	
				big sagebrush	8	
				true mountain mahogany	5	
				longflower rabbitbrush	4	
				antelope bitterbrush	3	
				other shrubs	2	
				pricklypear	3	
				other annual forbs	2	
Menefee	---	Favorable	---	blue grama	10	
		Normal	---	galleta	10	
		Unfavorable	---	sideoats grama	5	
				big sagebrush	5	
				Gambel's oak	5	
Orlie	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
156:						
Lindrith------	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3
Royosa--------	Sandy	Favorable	900	western wheatgrass		15
		Normal	700	Indian ricegrass		10
		Unfavorable	500	dropseed		10
				needleandthread		10
				galleta		10
				blue grama		5
				prairie junegrass		3
				muttongrass		2
				other annual grasses		5
				thinleaf fourwing saltbush		6
				winterfat		6
				big sagebrush		3
				rabbitbrush		3
				spineless horsebrush		3
				prairie sagewort		2
				sand sagebrush		1
				oneseed juniper		1
				other shrubs		2
				buckwheat		1
				other annual forbs		2
214:						
Quimera-------	Mountain Shale	Favorable	1200	western wheatgrass		25
		Normal	900	prairie junegrass		10
		Unfavorable	600	spike muhly		7
				blue grama		6
				alkali sacaton		5
				muttongrass		5
				bottlebrush squirreltail		5
				other annual grasses		7
				big sagebrush		10
				thinleaf fourwing saltbush		3
				winterfat		2
				other shrubs		5
				buckwheat		3
				other annual forbs		7

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
214:						
Ishkoten------	---	Favorable	---	elk sedge		8
		Normal	---	blue grama		8
		Unfavorable	---	Canada wildrye		8
				bluegrass		6
				sedge		2
				needleandthread		2
				Arizona fescue		2
				bottlebrush squirreltail		2
				other perennial grasses		5
				Gambel's oak		18
				true mountain mahogany		8
				antelope bitterbrush		2
				serviceberry		1
				other shrubs		4
				Oregongrape		4
				pingue hymenoxys		3
				lupine		2
				buckwheat		2
				pussytoes		1
				western yarrow		2
				other perennial forbs		8
220:						
Skyvillage----	---	Favorable	---	blue grama		25
		Normal	---	galleta		16
		Unfavorable	---	Indian ricegrass		10
				threeawn		7
				other annual grasses		5
				big sagebrush		10
				longflower rabbitbrush		5
				broom snakeweed		3
				antelope bitterbrush		3
				pingue hymenoxys		2
				prairie sagewort		2
				other shrubs		2
				yucca		5
				buckwheat		3
				other annual forbs		2
Eslendo-------	---	Favorable	---	blue grama		20
		Normal	---	galleta		15
		Unfavorable	---	Indian ricegrass		12
				bottlebrush squirreltail		8
				alkali sacaton		5
				other annual grasses		3
				big sagebrush		8
				longflower rabbitbrush		7
				broom snakeweed		5
				antelope bitterbrush		4
				other shrubs		3
				yucca		5
				buckwheat		3
				other annual forbs		2

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
220:						
Rock Outcrop--	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
229:						
Nusmag--------	Mountain Meadows	Favorable	3500	tufted hairgrass		25
		Normal	3000	bluegrass		10
		Unfavorable	2400	sedge		10
				western wheatgrass		5
				reedgrass		5
				clover		5
				shrubby cinquefoil		5
				Rocky Mountain iris		5
				other perennial forbs		10
Tottles-------	Mountain Meadows	Favorable	3500	tufted hairgrass		25
		Normal	3000	bluegrass		10
		Unfavorable	2400	sedge		10
				western wheatgrass		5
				reedgrass		5
				Canada wildrye		5
				clover		5
				shrubby cinquefoil		5
				Rocky Mountain iris		5
				other perennial forbs		10
231:						
Sparham-------	Salty Bottomland	Favorable	1500	alkali sacaton		30
		Normal	1050	western wheatgrass		20
		Unfavorable	600	galleta		10
				blue grama		5
				thinleaf fourwing saltbush		7
				greasewood		5
				winterfat		5
				shadscale saltbush		4
				iodinebush		2
				other shrubs		2
				goldenweed		2
				groundsel		2
				cuman ragweed		1
				other annual forbs		5

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
303:						
Orlie	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				prairie sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3
304:						
Orlie	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3
Nalivag	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
310:						
Rock Outcrop--	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
Vessilla------	---	Favorable	---	blue grama	20	
		Normal	---	bottlebrush squirreltail	10	
		Unfavorable	---	Kentucky bluegrass	10	
				Indian ricegrass	7	
				western wheatgrass	7	
				galleta	7	
				other annual grasses	3	
				antelope bitterbrush	10	
				true mountain mahogany	5	
				Gambel's oak	5	
				big sagebrush	4	
				other shrubs	3	
				pricklypear	6	
				other annual forbs	3	
Menefee-------	---	Favorable	---	Kentucky bluegrass	15	
		Normal	---	blue grama	15	
		Unfavorable	---	western wheatgrass	10	
				Indian ricegrass	5	
				prairie junegrass	5	
				galleta	5	
				elk sedge	2	
				other annual grasses	3	
				true mountain mahogany	10	
				antelope bitterbrush	10	
				Gambel's oak	5	
				big sagebrush	5	
				other shrubs	3	
				yucca	3	
				pricklypear	1	
				other annual forbs	3	
340:						
Riverwash-----	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
Kwakina-------	Sandy	Favorable	900	Indian ricegrass		20
		Normal	600	dropseed		15
		Unfavorable	300	galleta		10
				blue grama		5
				needleandthread		5
				poverty threeawn		5
				bottlebrush squirreltail		5
				other perennial grasses		5
				big sagebrush		4
				winterfat		4
				thinleaf fourwing saltbush		4
				Mormon tea		4
				broom snakeweed		2
				soapweed yucca		2
				other shrubs		4
				tansymustard		2
				buckwheat		2
				other perennial forbs		2

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
340:						
Tapicito------	Loamy	Favorable	800	Indian ricegrass		20
		Normal	500	galleta		15
		Unfavorable	300	blue grama		15
				bottlebrush squirreltail		5
				sand dropseed		5
				western wheatgrass		5
				other annual grasses		5
				big sagebrush		5
				thinleaf fourwing saltbush		5
				other shrubs		5
				scarlet globemallow		3
				groundsel		2
				cuman ragweed		1
				aster		1
				penstemon		1
				other perennial forbs		7
350:						
Hosta---------	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3
370:						
Orlie---------	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
380:						
Teequee-------	---	Favorable	---	blue grama	12	
		Normal	---	western wheatgrass	10	
		Unfavorable	---	bluegrass	10	
				bottlebrush squirreltail	9	
				elk sedge	7	
				mountain muhly	2	
				other perennial grasses	3	
				Gambel's oak	13	
				big sagebrush	4	
				twoneedle pinyon	4	
				dwarf rabbitbrush	2	
				trefoil	10	
				Louisiana sagewort	5	
				pingue hymenoxys	5	
				other perennial forbs	4	
Menefee-------	---	Favorable	---	bluegrass	20	
		Normal	---	western wheatgrass	15	
		Unfavorable	---	pinyon ricegrass	10	
				blue grama	10	
				bottlebrush squirreltail	10	
				other annual grasses	4	
				Gambel's oak	5	
				antelope bitterbrush	8	
				true mountain mahogany	5	
				other shrubs	2	
				western yarrow	5	
				yucca	3	
				other annual forbs	3	
Vessilla------	---	Favorable	---	blue grama	20	
		Normal	---	bottlebrush squirreltail	10	
		Unfavorable	---	Kentucky bluegrass	10	
				Indian ricegrass	7	
				western wheatgrass	7	
				galleta	7	
				other annual grasses	3	
				antelope bitterbrush	10	
				true mountain mahogany	5	
				Gambel's oak	5	
				big sagebrush	4	
				other shrubs	3	
				pricklypear	6	
				other annual forbs	3	

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
390:						
Losindios-----	---	Favorable	---	elk sedge	15	
		Normal	---	bluegrass	12	
		Unfavorable	---	prairie junegrass	8	
				blue grama	7	
				spike muhly	3	
				needlegrass	3	
				Indian ricegrass	3	
				bluestem	3	
				western wheatgrass	3	
				other perennial grasses	3	
				Gambel's oak	15	
				antelope bitterbrush	7	
				other shrubs	3	
				pingue hymenoxys	9	
				trefoil	4	
				other perennial forbs	2	
Escrito-------	---	Favorable	---	mountain muhly	12	
		Normal	---	sedge	11	
		Unfavorable	---	Arizona fescue	11	
				pine dropseed	8	
				bottlebrush squirreltail	8	
				western wheatgrass	5	
				other perennial grasses	4	
				Gambel's oak	8	
				Rocky Mountain juniper	5	
				other shrubs	2	
				aster	6	
				buckwheat	4	
				trefoil	4	
				western yarrow	4	
				other perennial forbs	8	
Parkelei------	---	Favorable	---	blue grama	25	
		Normal	---	Indian ricegrass	10	
		Unfavorable	---	bottlebrush squirreltail	6	
				prairie junegrass	6	
				Arizona fescue	5	
				bluegrass	5	
				western wheatgrass	3	
				galleta	3	
				other annual grasses	3	
				oneseed juniper	10	
				big sagebrush	5	
				pingue hymenoxys	3	
				antelope bitterbrush	2	
				Gambel's oak	2	
				other shrubs	2	
				pricklypear	4	
				yucca	2	
				lupine	1	
				other annual forbs	3	

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
403:						
Vosburg-------	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3
Millpaw-------	Clayey	Favorable	1200	western wheatgrass		25
		Normal	900	alkali sacaton		20
		Unfavorable	600	bottlebrush squirreltail		7
				galleta		6
				blue grama		5
				prairie junegrass		4
				muttongrass		4
				spike muhly		3
				other perennial grasses		5
				big sagebrush		5
				fourwing saltbush		3
				winterfat		2
				rabbitbrush		1
				other shrubs		2
				prairie sagewort		2
				buckwheat		2
				globemallow		2
				other annual forbs		2
421:						
Argiustolls---	---	Favorable	---	blue grama	15	
		Normal	---	Indian ricegrass	10	
		Unfavorable	---	western wheatgrass	10	
				blue grama	5	
				bottlebrush squirreltail	5	
				muttongrass	5	
				little bluestem	5	
				Gambel's oak	15	
				big sagebrush	10	
				true mountain mahogany	5	
				other shrubs	5	
				buckwheat	5	
				other perennial forbs	5	

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
421:						
Ustorthents---	---	Favorable	---	blue grama	15	
		Normal	---	Indian ricegrass	10	
		Unfavorable	---	western wheatgrass	10	
				blue grama	5	
				bottlebrush squirreltail	5	
				muttongrass	5	
				little bluestem	5	
				Gambel's oak	15	
				true mountain mahogany	10	
				saltbush	5	
				other shrubs	10	
				buckwheat	5	
				other perennial forbs	5	
Rock Outcrop--	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
430:						
Wilmac--------	Loamy	Favorable	---	western wheatgrass		25
		Normal	---	blue grama		10
		Unfavorable	---	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3
Hosta---------	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
440:						
Losindios	---	Favorable	---	elk sedge	15	
		Normal	---	bluegrass	12	
		Unfavorable	---	prairie junegrass	8	
				blue grama	7	
				spike muhly	3	
				needlegrass	3	
				Indian ricegrass	3	
				bluestem	3	
				western wheatgrass	3	
				other perennial grasses	3	
				Gambel's oak	15	
				antelope bitterbrush	7	
				other shrubs	3	
				pingue hymenoxys	9	
				trefoil	4	
				other perennial forbs	2	
Jaythree	---	Favorable	---	blue grama	15	
		Normal	---	elk sedge	13	
		Unfavorable	---	Arizona fescue	10	
				bluegrass	6	
				western wheatgrass	5	
				nodding brome	5	
				Canada wildrye	5	
				Gambel's oak	17	
				dwarf rabbitbrush	4	
				pingue hymenoxys	9	
				other perennial forbs	9	
452:						
Gojiya	Salt Meadow	Favorable	2000	inland saltgrass		32
		Normal	1600	alkali sacaton		18
		Unfavorable	1200	alkali cordgrass		15
				western wheatgrass		7
				Nuttall alkaligrass		5
				saltsedge		5
				foxtail barley		3
				other annual grasses		5
				thinleaf fourwing saltbush		3
				other shrubs		2
				iodinebush		3
				other annual forbs		2

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
500:						
Escrito--------	---	Favorable	---	sedge	11	
		Normal	---	Arizona fescue	11	
		Unfavorable	---	pine dropseed	8	
				bottlebrush squirreltail	8	
				western wheatgrass	5	
				other perennial grasses	4	
				Gambel's oak	8	
				Rocky Mountain juniper	5	
				other shrubs	2	
				aster	6	
				buckwheat	4	
				trefoil	4	
				western yarrow	4	
				other perennial forbs	8	
Rock Outcrop--	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
Dulcepeak-----	---	Favorable	---	blue grama	25	
		Normal	---	mountain muhly	20	
		Unfavorable	---	bottlebrush squirreltail	10	
				pine dropseed	8	
				needlegrass	2	
				other annual grasses	2	
				big sagebrush	8	
				Gambel's oak	5	
				Rocky Mountain juniper	4	
				longflower rabbitbrush	3	
				other shrubs	2	
				pingue hymenoxys	5	
				pricklypear	4	
				other annual forbs	2	
501:						
Zau----------	Mountain Slopes	Favorable	900	western wheatgrass		15
		Normal	700	mountain muhly		10
		Unfavorable	500	needleandthread		10
				sideoats grama		10
				Indian ricegrass		7
				Arizona fescue		5
				prairie junegrass		5
				blue grama		4
				sedge		4
				galleta		3
				other perennial grasses		7
				Gambel's oak		5
				big sagebrush		3
				other shrubs		2
				buckwheat		3
				Indian paintbrush		2
				penstemon		2
				other perennial forbs		3

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
501:						
Lomapedro-----	Mountain Slopes	Favorable	900	western wheatgrass		15
		Normal	700	mountain muhly		10
		Unfavorable	500	needleandthread		10
				sideoats grama		10
				Indian ricegrass		7
				Arizona fescue		5
				prairie junegrass		5
				blue grama		4
				sedge		4
				galleta		3
				other perennial grasses		7
				Gambel's oak		5
				big sagebrush		3
				other shrubs		2
				buckwheat		3
				Indian paintbrush		2
				penstemon		2
				other perennial forbs		3
515:						
Ustorthents---	---	Favorable	---	Arizona fescue	15	
		Normal	---	Indian ricegrass	10	
		Unfavorable	---	western wheatgrass	10	
				blue grama	5	
				bottlebrush squirreltail	5	
				muttongrass	5	
				little bluestem	5	
				Gambel's oak	15	
				true mountain mahogany	10	
				saltbush	5	
				other shrubs	5	
				buckwheat	5	
				other perennial forbs	5	
Rock Outcrop--	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
523:						
Suposo--------	Mountain Loam	Favorable	1400	Arizona fescue		20
		Normal	1100	Kentucky bluegrass		12
		Unfavorable	900	western wheatgrass		12
				sedge		12
				needlegrass		10
				prairie junegrass		5
				mountain muhly		5
				spike muhly		3
				other annual grasses		6
				prairie sagewort		3
				other shrubs		2
				curlycup gumweed		3
				buckwheat		2
				other annual forbs		5

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
523:						
Ohwiler-------	Mountain Loam	Favorable	1400	Arizona fescue		20
		Normal	1100	Kentucky bluegrass		12
		Unfavorable	900	western wheatgrass		12
				sedge		12
				needlegrass		10
				prairie junegrass		5
				mountain muhly		5
				spike muhly		3
				other annual grasses		6
				prairie sagewort		3
				other shrubs		2
				curlycup gumweed		3
				buckwheat		2
				other annual forbs		5
524:						
Jicarilla-----	Mountain Meadows	Favorable	3500	tufted hairgrass		25
		Normal	2950	sedge		20
		Unfavorable	2400	mountain brome		10
				sheep fescue		7
				western wheatgrass		7
				redtop		5
				rush		5
				Kentucky bluegrass		5
				Columbia needlegrass		3
				other annual grasses		2
				shrubby cinquefoil		3
				other shrubs		2
				Rocky Mountain iris		2
				clover		2
				other annual forbs		2
Ohwiler-------	Mountain Loam	Favorable	1400	Arizona fescue		20
		Normal	1100	Kentucky bluegrass		12
		Unfavorable	900	western wheatgrass		12
				sedge		12
				needlegrass		10
				prairie junegrass		5
				mountain muhly		5
				spike muhly		3
				other annual grasses		6
				prairie sagewort		3
				other shrubs		2
				curlycup gumweed		3
				buckwheat		2
				other annual forbs		5

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
525:						
Jaythree------	---	Favorable	---	blue grama	15	
		Normal	---	elk sedge	13	
		Unfavorable	---	Arizona fescue	10	
				bluegrass	6	
				western wheatgrass	5	
				nodding brome	5	
				Canada wildrye	5	
				Gambel's oak	17	
				dwarf rabbitbrush	4	
				pingue hymenoxys	9	
				other perennial forbs	9	
Cedarsprings--	---	Favorable	---	Arizona fescue	13	
		Normal	---	western wheatgrass	9	
		Unfavorable	---	elk sedge	9	
				Kentucky bluegrass	6	
				spike muhly	6	
				pine dropseed	4	
				other perennial grasses	3	
				Gambel's oak	18	
				Rocky Mountain juniper	6	
				other shrubs	2	
				fringed sagewort	7	
				western yarrow	7	
				Oregongrape	6	
526:						
Hetz----------	Mountain Meadows	Favorable	3500	tufted hairgrass		25
		Normal	2950	sedge		20
		Unfavorable	2400	mountain brome		10
				sheep fescue		7
				western wheatgrass		7
				redtop		5
				rush		5
				Kentucky bluegrass		5
				Columbia needlegrass		3
				other annual grasses		2
				shrubby cinquefoil		3
				other shrubs		2
				Rocky Mountain iris		2
				clover		2
				other annual forbs		2

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
530:						
Wilmac---------	Mountain Slopes	Favorable	900	western wheatgrass		15
		Normal	700	mountain muhly		10
		Unfavorable	500	needleandthread		10
				sideoats grama		10
				Indian ricegrass		7
				Arizona fescue		5
				prairie junegrass		5
				blue grama		4
				sedge		4
				galleta		3
				other perennial grasses		7
				Gambel's oak		5
				big sagebrush		3
				other shrubs		2
				buckwheat		3
				Indian paintbrush		2
				penstemon		2
				other perennial forbs		3
Hosta---------	Mountain Slopes	Favorable	900	western wheatgrass		15
		Normal	700	mountain muhly		10
		Unfavorable	500	needleandthread		10
				sideoats grama		10
				Indian ricegrass		7
				Arizona fescue		5
				prairie junegrass		5
				blue grama		4
				sedge		4
				galleta		3
				other perennial grasses		7
				Gambel's oak		5
				big sagebrush		3
				other shrubs		2
				buckwheat		3
				Indian paintbrush		2
				penstemon		2
				other perennial forbs		3
Millpaw-------	Mountain Loam	Favorable	1400	Arizona fescue		20
		Normal	1100	Kentucky bluegrass		12
		Unfavorable	900	western wheatgrass		12
				sedge		12
				needlegrass		10
				prairie junegrass		5
				mountain muhly		5
				spike muhly		3
				other annual grasses		6
				prairie sagewort		3
				other shrubs		2
				curlycup gumweed		3
				buckwheat		2
				other annual forbs		5

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
531:						
Horselake-----	Mountain Shale	Favorable	1200	western wheatgrass		25
		Normal	900	prairie junegrass		10
		Unfavorable	600	spike muhly		7
				blue grama		6
				alkali sacaton		5
				muttongrass		5
				bottlebrush squirreltail		5
				other annual grasses		7
				big sagebrush		10
				low sage		3
				winterfat		2
				other shrubs		5
				buckwheat		3
				other annual forbs		7
Menefee-------	---	Favorable	---	blue grama	20	
		Normal	---	western wheatgrass	15	
		Unfavorable	---	Indian ricegrass	10	
				Kentucky bluegrass	5	
				other annual grasses	3	
				Gambel's oak	10	
				big sagebrush	7	
				black sagebrush	6	
				Rocky Mountain juniper	5	
				other shrubs	3	
				pingue hymenoxys	5	
				trefoil	4	
				sedge	4	
				other annual forbs	3	
533:						
Badland-------	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
540:						
Ishkoten------	---	Favorable	---	elk sedge	8	
		Normal	---	blue grama	8	
		Unfavorable	---	Canada wildrye	8	
				bluegrass	6	
				sedge	2	
				needleandthread	2	
				Arizona fescue	2	
				bottlebrush squirreltail	2	
				other perennial grasses	5	
				Gambel's oak	18	
				true mountain mahogany	8	
				Oregongrape	4	
				rose	2	
				antelope bitterbrush	2	
				serviceberry	1	
				other shrubs	4	
				pingue hymenoxys	3	
				lupine	2	
				buckwheat	2	
				western yarrow	2	
				pussytoes	1	
				other perennial forbs	8	

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
540:						
Lajuita-------	---	Favorable	---	prairie junegrass		7
		Normal	---	elk sedge		7
		Unfavorable	---	Canada wildrye		7
				other perennial grasses		3
				Gambel's oak		20
				true mountain mahogany		18
				antelope bitterbrush		17
				other shrubs		10
				lupine		4
				other perennial forbs		7
Escrito-------	---	Favorable	---	bluegrass		18
		Normal	---	nodding brome		11
		Unfavorable	---	Canada wildrye		10
				Arizona fescue		6
				other perennial grasses		3
				Gambel's oak		26
				rose		10
				antelope bitterbrush		3
				other shrubs		3
				buckwheat		4
				trefoil		3
				other perennial forbs		3
541:						
Ishkoten------	---	Favorable	---	elk sedge		15
		Normal	---	Canada wildrye		9
		Unfavorable	---	bluegrass		8
				nodding brome		8
				Arizona fescue		7
				muhly		6
				bluestem		4
				Indian ricegrass		3
				prairie junegrass		2
				brome		2
				sedge		1
				other perennial grasses		8
				Gambel's oak		20
				rose		5
				snowberry		2
				other shrubs		5
				buckwheat		1
				western yarrow		1
				other perennial forbs		5
Lajuita-------	---	Favorable	---	prairie junegrass		7
		Normal	---	elk sedge		7
		Unfavorable	---	Canada wildrye		7
				other perennial grasses		3
				Gambel's oak		20
				true mountain mahogany		18
				antelope bitterbrush		17
				other shrubs		10
				lupine		4
				other perennial forbs		7

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
552:						
Haplustalfs	---	Favorable	---	elk sedge	10	
		Normal	---	Arizona fescue	9	
		Unfavorable	---	Canada wildrye	9	
				nodding brome	6	
				bluegrass	4	
				other perennial grasses	3	
				Gambel's oak	29	
				antelope bitterbrush	10	
				true mountain mahogany	2	
				other shrubs	5	
				buckwheat	3	
				western yarrow	3	
				trefoil	2	
				other perennial forbs	5	
Argiustolls	---	Favorable	---	sedge	10	
		Normal	---	bluegrass	5	
		Unfavorable	---	California brome	5	
				timber oatgrass	3	
				spike bentgrass	3	
				nodding brome	3	
				other perennial grasses	1	
				snowberry	16	
				Oregongrape	16	
				Gambel's oak	11	
				serviceberry	10	
				Douglas fir	3	
				other shrubs	1	
				trefoil	7	
				canyon grape	5	
				other perennial forbs	1	
553:						
Haplustalfs	---	Favorable	---	elk sedge	10	
		Normal	---	Arizona fescue	9	
		Unfavorable	---	Canada wildrye	9	
				nodding brome	6	
				bluegrass	4	
				other perennial grasses	3	
				Gambel's oak	29	
				antelope bitterbrush	10	
				true mountain mahogany	2	
				other shrubs	5	
				buckwheat	3	
				western yarrow	3	
				trefoil	2	
				other perennial forbs	5	

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
553:						
Ustorthents---	---	Favorable	---	Arizona fescue	15	
		Normal	---	Indian ricegrass	10	
		Unfavorable	---	western wheatgrass	10	
				blue grama	5	
				bottlebrush squirreltail	5	
				muttongrass	5	
				little bluestem	5	
				Gambel's oak	15	
				true mountain mahogany	10	
				saltbush	5	
				other shrubs	5	
				buckwheat	5	
				other perennial forbs	5	
560:						
Herm----------	---	Favorable	---	bluegrass	10	
		Normal	---	sedge	6	
		Unfavorable	---	timber oatgrass	5	
				Canada wildrye	4	
				western wheatgrass	4	
				Arizona fescue	3	
				muhly	2	
				spike bentgrass	2	
				other perennial grasses	4	
				Gambel's oak	16	
				Oregongrape	5	
				snowberry	5	
				antelope bitterbrush	1	
				true mountain mahogany	1	
				other shrubs	4	
				trefoil	7	
				western yarrow	3	
				buckwheat	2	
				other perennial forbs	16	
Dulcepeak-----	---	Favorable	---	elk sedge	6	
		Normal	---	mountain muhly	6	
		Unfavorable	---	sedge	4	
				Canada wildrye	4	
				prairie junegrass	2	
				bluegrass	2	
				timber oatgrass	2	
				other perennial grasses	4	
				Gambel's oak	18	
				snowberry	8	
				true mountain mahogany	4	
				Oregongrape	4	
				yucca	2	
				antelope bitterbrush	2	
				serviceberry	2	
				other shrubs	3	
				Indian paintbrush	4	
				pingue hymenoxys	4	
				western yarrow	4	
				trefoil	4	
				other annual forbs	11	

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
571:						
Orlie	Loamy	Favorable	1100	western wheatgrass		25
		Normal	850	blue grama		10
		Unfavorable	600	Indian ricegrass		7
				needleandthread		7
				galleta		5
				spike muhly		4
				alkali sacaton		4
				prairie junegrass		4
				muttongrass		3
				other annual grasses		5
				big sagebrush		5
				fringed sagewort		4
				thinleaf fourwing saltbush		3
				winterfat		3
				rabbitbrush		2
				other shrubs		3
				buckwheat		3
				other perennial forbs		3
Cementlake	Salty Bottomland	Favorable	1500	alkali sacaton		30
		Normal	1050	western wheatgrass		20
		Unfavorable	600	galleta		10
				blue grama		5
				big sagebrush		7
				greasewood		5
				winterfat		5
				low sage		4
				iodinebush		2
				other shrubs		2
				goldenweed		2
				groundsel		2
				cuman ragweed		1
				other annual forbs		5
580:						
Archmesa	---	Favorable	---	Arizona fescue	25	
		Normal	---	mountain brome	25	
		Unfavorable	---	sedge	5	
				other perennial grasses	5	
				common snowberry	10	
				Oregongrape	6	
				quaking aspen	5	
				Douglas fir	5	
				violet	10	
				other perennial forbs	4	
Skyute	---	Favorable	---	Arizona fescue	25	
		Normal	---	mountain brome	25	
		Unfavorable	---	sedge	5	
				other perennial grasses	5	
				Oregongrape	6	
				common snowberry	10	
				quaking aspen	5	
				Douglas fir	5	
				violet	10	
				other perennial forbs	4	

Table 6.--Rangeland and Forestland Understory Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total production		Characteristic vegetation	Composition	
		Kind of year	Dry weight		Forest Understory	Range
			Lb/acre		Pct	Pct
590:						
Abreu Family--	---	Favorable	---	Arizona fescue	15	
		Normal	---	mountain muhly	10	
		Unfavorable	---	bluegrass	10	
				other perennial grasses	5	
				Gambel's oak	5	
				mountain big sagebrush	5	
				other shrubs	5	
				other perennial forbs	5	
Rubbleland----	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
Rock Outcrop--	---	Favorable	---			
		Normal	---			
		Unfavorable	---			
600:						
Haplustepts---	---	Favorable	---	sedge	10	
		Normal	---	bluegrass	5	
		Unfavorable	---	California brome	5	
				timber oatgrass	3	
				spike bentgrass	3	
				nodding brome	3	
				other perennial grasses	1	
				snowberry	16	
				Oregongrape	16	
				Gambel's oak	11	
				serviceberry	10	
				Douglas fir	3	
				other shrubs	1	
				trefoil	7	
				canyon grape	5	
				other perennial forbs	1	
Haplustalfs---	---	Favorable	---	elk sedge	10	
		Normal	---	Arizona fescue	9	
		Unfavorable	---	Canada wildrye	9	
				nodding brome	6	
				bluegrass	4	
				other perennial grasses	3	
				Gambel's oak	29	
				antelope bitterbrush	10	
				true mountain mahogany	2	
				other shrubs	5	
				buckwheat	3	
				western yarrow	3	
				trefoil	2	
				other perennial forbs	5	

Table 7.--Forest Productivity

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
20:				
Menefee	oneseed juniper	89	---	---
	twoneedle pinyon	22	---	
Vessilla	oneseed juniper	52	---	---
	twoneedle pinyon	53	---	
Rock outcrop	---	---	---	---
21:				
Badland	---	---	---	---
Menefee	oneseed juniper	62	---	---
	twoneedle pinyon	28	---	
Rock outcrop	---	---	---	---
40:				
Parkelei	twoneedle pinyon	73	---	pinyon pine
	oneseed junipera	43	---	
	Rocky Mountain juniper	21	---	
Menefee	oneseed junipera	89	---	---
	twoneedle pinyon	22	---	
Vessilla	twoneedle pinyon	54	---	---
	oneseed junipera	30	---	
	Rocky Mountain juniper	10	---	
214:				
Quimera	Rocky Mountain juniper	---	---	---
Ishkoten	Rocky Mountain juniper	---	---	---
	ponderosa pine	50	---	
220:				
Skyvillage	juniper (woodland)	55	---	---
	twoneedle pinyon	25	---	
Eslendo	juniper (woodland)	37	---	---
	twoneedle pinyon	30	---	
Rock outcrop	---	---	---	---
380:				
Teequee	oneseed juniper	40	---	pinyon pine
	twoneedle pinyon	17	---	

Table 7.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
380:				
Menefee	oneseed junipera	74	---	---
	twoneedle pinyon	25	---	
Vessilla	oneseed junipera	52	---	---
	twoneedle pinyon	53	---	
390:				
Losindios	ponderosa pine	60	---	ponderosa pine
	Rocky Mountain juniper	---	---	
Escrito	Rocky Mountain juniper	---	---	---
	ponderosa pine	58	---	
	twoneedle pinyon	---	---	
Parkelei	Rocky Mountain juniper	---	---	pinyon pine
	twoneedle pinyon	73	---	
421:				
Argiustolls	Rocky Mountain juniper	---	---	---
	twoneedle pinyon	---	---	
	ponderosa pine	45	---	
Ustorthents	Rocky Mountain juniper	---	---	---
Rock outcrop	---	---	---	---
440:				
Losindios	ponderosa pine	60	---	ponderosa pine
Jaythree	ponderosa pine	76	---	ponderosa pine
500:				
Escrito	Rocky Mountain juniper	---	---	ponderosa pine
	ponderosa pine	45	---	
	twoneedle pinyon	---	---	
Rock outcrop	---	---	---	---
Dulcepeak	ponderosa pine	60	---	ponderosa pine
	twoneedle pinyon	38	---	
	Rocky Mountain juniper	34	---	
515:				
Ustorthents	Rocky Mountain juniper	---	---	---
Rock outcrop	---	---	---	---

Table 7.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
525:				
Jaythree	ponderosa pine	75	---	ponderosa pine
Cedarsprings	ponderosa pine	75	---	ponderosa pine
531:				
Horselake	Rocky Mountain juniper	29	---	---
Menefee	Rocky Mountain juniper	35	---	---
	oneseed juniper	82	---	
	twoneedle pinyon	41	---	
540:				
Ishkoten	ponderosa pine	60	---	ponderosa pine
	Rocky Mountain juniper	---	---	
Lajuita	ponderosa pine	50	---	ponderosa pine
	Rocky Mountain juniper	---	---	
	twoneedle pinyon	---	---	
Escrito	ponderosa pine	55	---	ponderosa pine
	Rocky Mountain juniper	---	---	
	twoneedle pinyon	---	---	
541:				
Ishkoten	ponderosa pine	70	---	ponderosa pine,
	Douglas fir	63	---	Douglas fir
Lajuita	ponderosa pine	60	---	ponderosa pine
552:				
Haplustalfs	---	---	---	ponderosa pine
Argiustolls	ponderosa pine	---	---	ponderosa pine,
	Douglas fir	---	---	Douglas fir,
	quaking aspen	---	---	quaking aspen
553:				
Haplustalfs	ponderosa pine	---	---	ponderosa pine
Ustorthents	Rocky Mountain juniper	---	---	---
560:				
Herm	ponderosa pine	65	---	ponderosa pine
	Douglas fir	---	---	
Dulcepeak	ponderosa pine	60	---	ponderosa pine
	Douglas fir	---	---	

Table 7.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
580:				
Archmesa	ponderosa pine	80	---	ponderosa pine, Douglas fir
	Douglas fir	---	---	
	quaking aspen	---	---	
Skyute	ponderosa pine	60	---	ponderosa pine
590:				
Abreu Family	ponderosa pine	70	---	ponderosa pine
Rubbleland	---	---	---	---
Rock outcrop	---	---	---	---
600:				
Haplustepts	Douglas fir	63	---	Douglas fir, ponderosa pine
	ponderosa pine	70	---	
Haplustalfs	Douglas fir	63	---	Douglas fir, ponderosa pine
	ponderosa pine	70	---	

Table 8a.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
214:							
Quimera	60	Severe		Poorly suited		Severe	
		Restrictive layer limitation	1.00	Slope limitation	1.00	Strength limitation	1.00
		Slope limitation	0.50				
		Strength limitation	0.50				
Ishkoten	25	Moderate		Poorly suited		Severe	
		Slope limitation	0.50	Slope limitation	1.00	Strength limitation	1.00
		Strength limitation	0.50	Strength limitation	0.50		
390:							
Losindios	35	Moderate		Poorly suited		Moderate	
		Slope limitation	0.50	Slope limitation	1.00	Strength limitation	0.50
Escrito	30	Severe		Moderately well suited		Severe	
		Restrictive layer limitation	1.00	Slope limitation	0.50	Strength limitation	1.00
		Strength limitation	0.50				
Parkelei	35	Moderate		Poorly suited		Moderate	
		Slope limitation	0.50	Slope limitation	1.00	Strength limitation	0.50
440:							
Losindios	60	Slight		Moderately well suited		Moderate	
				Slope limitation	0.50	Strength limitation	0.50
Jaythree	20	Moderate		Moderately well suited		Severe	
		Strength limitation	0.50	Strength limitation	0.50	Strength limitation	1.00
500:							
Escrito	45	Severe		Poorly suited		Severe	
		Restrictive layer limitation	1.00	Slope limitation	1.00	Strength limitation	1.00
		Slope limitation	0.50	Strength limitation	0.50		
		Strength limitation	0.50				

Table 8a.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
500:							
Dulcepeak	20	Severe		Poorly suited		Moderate	
		Restrictive layer limitation	1.00	Slope limitation	1.00	Strength limitation	0.50
		Slope limitation	0.50				
		Strength limitation	0.50				
525:							
Jaythree	65	Moderate		Poorly suited		Severe	
		Slope limitation	0.50	Slope limitation	1.00	Strength limitation	1.00
		Strength limitation	0.50	Strength limitation	0.50		
Cedarsprings	25	Moderate		Moderately well suited		Severe	
		Strength limitation	0.50	Strength limitation	0.50	Strength limitation	1.00
				Slope limitation	0.50		
540:							
Ishkoten	45	Severe		Poorly suited		Moderate	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.50
		Strength limitation	0.50	Strength limitation	0.50		
Lajuita	25	Severe		Poorly suited		Severe	
		Restrictive layer limitation	1.00	Slope limitation	1.00	Strength limitation	1.00
		Slope limitation	0.50	Strength limitation	0.50		
		Strength limitation	0.50				
Escrito	20	Severe		Poorly suited		Moderate	
		Restrictive layer limitation	1.00	Slope limitation	1.00	Strength limitation	0.50
		Slope limitation	0.50				
		Strength limitation	0.50				
541:							
Ishkoten	55	Severe		Poorly suited		Moderate	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.50
		Strength limitation	0.50	Strength limitation	0.50		

Table 8a.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
541:							
Lajuita	30	Severe		Poorly suited		Severe	
		Restrictive layer limitation	1.00	Slope limitation	1.00	Strength limitation	1.00
		Slope limitation	0.50	Strength limitation	0.50		
		Strength limitation	0.50				
552:							
Haplustalfs	40	Severe		Poorly suited		Slight	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.10
				Stoniness limitation	0.50		
Argiustolls	30	Severe		Poorly suited		Moderate	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.50
		Strength limitation	0.50	Stoniness limitation	0.50		
				Strength limitation	0.50		
553:							
Haplustalfs	55	Severe		Poorly suited		Slight	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.10
		Stoniness limitation	1.00	Stoniness limitation	0.50		
Ustorthents	30	Severe		Poorly suited		Slight	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.10
		Stoniness limitation	1.00	Stoniness limitation	0.50		
560:							
Herm	45	Moderate		Moderately well suited		Severe	
		Strength limitation	0.50	Strength limitation	0.50	Strength limitation	1.00
				Slope limitation	0.50		
Dulcepeak	40	Severe		Poorly suited		Moderate	
		Restrictive layer limitation	1.00	Slope limitation	1.00	Strength limitation	0.50
		Slope limitation	0.50	Strength limitation	0.50		
		Strength limitation	0.50				

Table 8a.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
580:							
Archmesa	60	Moderate		Moderately well suited		Severe	
		Restrictive layer limitation	0.50	Slope limitation	0.50	Strength limitation	1.00
		Strength limitation	0.50	Strength limitation	0.50		
Skyute	25	Severe		Moderately well suited		Severe	
		Restrictive layer limitation	1.00	Slope limitation	0.50	Strength limitation	1.00
		Strength limitation	0.50	Strength limitation	0.50		
590:							
Abreu Family	65	Severe		Poorly suited		Moderate	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.50
		Strength limitation	0.50	Strength limitation	0.50		
600:							
Haplustepts	50	Severe		Poorly suited		Moderate	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.50
		Strength limitation	0.50	Stoniness limitation	0.50		
				Strength limitation	0.50		
Haplustalfs	35	Severe		Poorly suited		Slight	
		Slope limitation	1.00	Slope limitation	1.00	Strength limitation	0.10
				Stoniness limitation	0.50		

Table 8b.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
214:							
Quimera	60	Moderate Slope/erodibility limitation	0.49	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation	1.00
Ishkoten	25	Moderate Slope/erodibility limitation	0.45	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Strength limitation	1.00 0.50
390:							
Losindios	35	Moderate Slope/erodibility limitation	0.29	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation	1.00
Escrito	30	Slight Slope/erodibility limitation	0.20	Severe Slope/erodibility limitation	1.00	Moderately well suited Slope limitation	0.50
Parkelei	25	Slight Slope/erodibility limitation	0.12	Moderate Slope/erodibility limitation	0.67	Moderately well suited Slope limitation Strength limitation	0.50 0.50
440:							
Losindios	60	Slight Slope/erodibility limitation	0.16	Moderate Slope/erodibility limitation	0.89	Moderately well suited Slope limitation	0.50
Jaythree	20	Slight Slope/erodibility limitation	0.06	Slight Slope/erodibility limitation	0.19	Moderately well suited Strength limitation	0.50
500:							
Escrito	45	Moderate Slope/erodibility limitation	0.29	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Strength limitation	1.00 0.50

Table 8b.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
500:							
Dulcepeak	20	Moderate Slope/erodibility limitation	0.29	Moderate Slope/erodibility limitation	0.94	Poorly suited Slope limitation	1.00
525:							
Jaythree	65	Moderate Slope/erodibility limitation	0.29	Moderate Slope/erodibility limitation	0.94	Poorly suited Slope limitation Strength limitation	1.00 0.50
Cedarsprings	25	Slight Slope/erodibility limitation	0.16	Moderate Slope/erodibility limitation	0.89	Moderately well suited Strength limitation Slope limitation	 0.50 0.50
540:							
Ishkoten	45	Severe Slope/erodibility limitation	0.69	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Strength limitation	1.00 0.50
Lajuita	25	Moderate Slope/erodibility limitation	0.49	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Strength limitation	1.00 0.50
Escrito	20	Moderate Slope/erodibility limitation	0.29	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation	1.00
541:							
Ishkoten	55	Severe Slope/erodibility limitation	0.69	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Strength limitation	1.00 0.50
Lajuita	30	Moderate Slope/erodibility limitation	0.49	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Strength limitation	1.00 0.50
552:							
Haplustalfs	40	Very severe Slope/erodibility limitation	1.00	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Stoniness limitation	1.00 0.50

Table 8b.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
552:							
Argiustolls	30	Very severe		Severe		Poorly suited	
		Slope/erodibility limitation	1.00	Slope/erodibility limitation	1.00	Slope limitation	1.00
						Stoniness limitation	0.50
						Strength limitation	0.50
553:							
Haplustalfs	55	Very severe		Severe		Poorly suited	
		Slope/erodibility limitation	1.00	Slope/erodibility limitation	1.00	Slope limitation	1.00
						Stoniness limitation	0.50
Ustorthents	30	Very severe		Severe		Poorly suited	
		Slope/erodibility limitation	1.00	Slope/erodibility limitation	1.00	Slope limitation	1.00
						Stoniness limitation	0.50
560:							
Herm	45	Slight		Moderate		Moderately well suited	
		Slope/erodibility limitation	0.17	Slope/erodibility limitation	0.78	Strength limitation	0.50
						Slope limitation	0.50
Dulcepeak	40	Moderate		Severe		Poorly suited	
		Slope/erodibility limitation	0.49	Slope/erodibility limitation	1.00	Slope limitation	1.00
						Strength limitation	0.50
580:							
Archmesa	60	Slight		Severe		Moderately well suited	
		Slope/erodibility limitation	0.20	Slope/erodibility limitation	1.00	Slope limitation	0.50
						Strength limitation	0.50
Skyute	25	Slight		Severe		Moderately well suited	
		Slope/erodibility limitation	0.20	Slope/erodibility limitation	1.00	Slope limitation	0.50
						Strength limitation	0.50

Table 8b.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
590:							
Abreu Family	65	Very severe Slope/erodibility limitation	1.00	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Strength limitation	1.00 0.50
600:							
Haplustepts	50	Very severe Slope/erodibility limitation	1.00	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Stoniness limitation Strength limitation	1.00 0.50 0.50
Haplustalfs	35	Very severe Slope/erodibility limitation	1.00	Severe Slope/erodibility limitation	1.00	Poorly suited Slope limitation Stoniness limitation	1.00 0.50

Table 8c.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
214:							
Ishkoten	25	Moderately well suited Stoniness limitation	0.50	Poorly suited Slope limitation Stoniness limitation	0.75 0.75	Moderately well suited Strength limitation Slope limitation	0.50 0.50
390:							
Losindios	35	Well suited		Moderately well suited Slope limitation	0.50	Well suited	
Escrito	30	Poorly suited Restrictive layer limitation	1.00	Moderately well suited Slope limitation Stoniness limitation	0.50 0.50	Well suited	
440:							
Losindios	60	Well suited		Moderately well suited Slope limitation	0.50	Well suited	
Jaythree	20	Well suited		Well suited		Moderately well suited Strength limitation	0.50
500:							
Escrito	45	Poorly suited Restrictive layer limitation	1.00	Moderately well suited Stoniness limitation Slope limitation	0.50 0.50	Moderately well suited Strength limitation	0.50
Dulcepeak	20	Moderately well suited Stickiness limitation	0.50	Moderately well suited Stickiness limitation Stoniness limitation Slope limitation	0.50 0.50 0.50	Well suited	

Table 8c.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
525:							
Jaythree	65	Well suited		Moderately well suited Slope limitation	0.50	Moderately well suited Strength limitation	0.50
Cedarsprings	25	Well suited		Moderately well suited Slope limitation	0.50	Moderately well suited Strength limitation	0.50
540:							
Ishkoten	45	Moderately well suited Stoniness limitation Slope limitation	0.50 0.50	Unsuited Slope limitation Stoniness limitation	1.00 1.00	Moderately well suited Slope limitation Strength limitation	0.50 0.50
Lajuita	25	Moderately well suited Restrictive layer limitation	0.50	Poorly suited Slope limitation Stoniness limitation	0.75 0.50	Moderately well suited Strength limitation Slope limitation	0.50 0.50
Escrito	20	Well suited		Moderately well suited Slope limitation	0.50	Well suited	
541:							
Ishkoten	55	Moderately well suited Stoniness limitation Slope limitation	0.50 0.50	Unsuited Slope limitation Stoniness limitation	1.00 0.75	Moderately well suited Slope limitation Strength limitation	0.50 0.50
Lajuita	30	Moderately well suited Restrictive layer limitation	0.50	Poorly suited Slope limitation Stoniness limitation	0.75 0.50	Moderately well suited Strength limitation Slope limitation	0.50 0.50

Table 8c.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
552:							
Haplustalfs	40	Poorly suited		Unsuited		Poorly suited	
		Stoniness limitation	0.75	Stoniness limitation	1.00	Slope limitation	1.00
		Slope limitation	0.50	Slope limitation	1.00	Stoniness limitation	0.50
Argiustolls	30	Poorly suited		Unsuited		Poorly suited	
		Stoniness limitation	0.75	Stoniness limitation	1.00	Slope limitation	1.00
		Slope limitation	0.50	Slope limitation	1.00	Stoniness limitation	0.50
						Strength limitation	0.50
553:							
Haplustalfs	55	Unsuited		Unsuited		Poorly suited	
		Stoniness limitation	1.00	Stoniness limitation	1.00	Slope limitation	1.00
		Slope limitation	0.50	Slope limitation	1.00	Stoniness limitation	0.50
Ustorthents	30	Poorly suited		Unsuited		Poorly suited	
		Stoniness limitation	0.75	Stoniness limitation	1.00	Slope limitation	1.00
		Restrictive layer limitation	0.75	Slope limitation	1.00	Stoniness limitation	0.50
		Slope limitation	0.50				
560:							
Herm	45	Moderately well suited		Moderately well suited		Moderately well suited	
		Stickiness limitation	0.50	Stickiness limitation	0.50	Strength limitation	0.50
				Slope limitation	0.50		
Dulcepeak	40	Poorly suited		Unsuited		Moderately well suited	
		Stickiness limitation	0.50	Slope limitation	0.75	Slope limitation	0.50
				Stickiness limitation	0.50	Strength limitation	0.50
580:							
Archmesa	60	Moderately well suited		Moderately well suited		Moderately well suited	
		Restrictive layer limitation	.50	Slope limitation	0.50	Strength limitation	0.50
				Stoniness limitation	0.50		
				Restrictive layer limitation	0.50		

Table 8c.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
580:							
Skyute	25	Unsuited		Moderately well suited		Moderately well suited	
		Restrictive layer limitation	1.00	Slope limitation	0.50	Strength limitation	0.50
				Stoniness limitation	0.50		
				Restrictive layer limitation	0.50		
590:							
Abreu Family	65	Poorly suited		Unsuited		Poorly suited	
		Stoniness limitation	0.75	Slope limitation	1.00	Slope limitation	1.00
		Slope limitation	0.50	Stoniness limitation	1.00	Strength limitation	0.50
600:							
Haplustepts	50	Unsuited		Unsuited		Poorly suited	
		Restrictive layer limitation	1.00	Slope limitation	1.00	Slope limitation	1.00
		Stoniness limitation	0.75	Stoniness limitation	1.00	Stoniness limitation	0.50
		Slope limitation	0.50	Restrictive layer limitation	0.50	Strength limitation	0.50
Haplustalfs	35	Poorly suited		Unsuited		Poorly suited	
		Stoniness limitation	0.75	Slope limitation	1.00	Slope limitation	1.00
		Slope limitation	0.50	Stoniness limitation	1.00	Stoniness limitation	0.50

Table 8d.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
214:					
Quimera	60	Poorly suited Slope limitation Stoniness limitation	 0.50 0.50	Poorly suited Slope limitation	 0.50
Ishkoten	25	Poorly suited Slope limitation Stoniness limitation	 0.50 0.50	Poorly suited Slope limitation	 0.50
390:					
Losindios	35	Poorly suited Slope limitation	 0.50	Poorly suited Slope limitation	 0.50
Escrito	30	Well suited		Unsuited Restrictive layer limitation	 1.00
Parkelei	35	Poorly suited Slope limitation	 0.50	Poorly suited Slope limitation	 0.50
440:					
Losindios	60	Well suited		Well suited	
Jaythree	60	Well suited		Well suited	
500:					
Escrito	45	Poorly suited Slope limitation	 0.50	Unsuited Restrictive layer limitation Slope limitation	 1.00 0.50
Dulcepeak	20	Poorly suited Slope limitation	 0.50	Poorly suited Slope limitation	 0.50
525:					
Jaythree	65	Well suited		Well suited	
Cedarsprings	25	Well suited		Well suited	
540:					
Ishkoten	45	Poorly suited Slope limitation Stoniness limitation	 0.50 0.50	Poorly suited Slope limitation Stoniness limitation	 0.50 0.50

Table 8d.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
540:					
Lajuita	25	Poorly suited		Unsuited	
		Slope limitation	0.50	Restrictive layer limitation	1.00
				Slope limitation	0.50
Escrito	20	Poorly suited		Unsuited	
		Slope limitation	0.50	Restrictive layer limitation	1.00
				Slope limitation	0.50
541:					
Ishkoten	55	Poorly suited		Poorly suited	
		Slope limitation	0.50	Slope limitation	0.50
		Stoniness limitation	0.50		
Lajuita	30	Poorly suited		Unsuited	
		Slope limitation	0.50	Restrictive layer limitation	1.00
		Restrictive layer limitation	0.50	Slope limitation	0.50
		Stoniness limitation	0.50		
552:					
Haplustalfs	40	Unsuited		Unsuited	
		Slope limitation	1.00	Slope limitation	1.00
		Stoniness limitation	0.50	Stoniness limitation	0.50
Argiustolls	30	Unsuited		Unsuited	
		Slope limitation	1.00	Stoniness limitation	1.00
		Stoniness limitation	0.50	Slope limitation	1.00
553:					
Haplustalfs	55	Unsuited		Unsuited	
		Stoniness limitation	1.00	Stoniness limitation	1.00
		Slope limitation	1.00	Slope limitation	1.00
Ustorthents	30	Unsuited		Unsuited	
		Slope limitation	1.00	Stoniness limitation	1.00
		Stoniness limitation	0.50	Slope limitation	1.00

Table 8d.--Forestland Management--Continued

Map symbol and soil name	Pct of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
560:					
Herm	45	Well suited		Well suited	
Dulcepeak	40	Poorly suited		Unsuited	
		Stoniness limitation	0.50	Restrictive layer limitation	1.00
		Slope limitation	0.50	Stoniness limitation	0.50
				Slope limitation	0.50
580:					
Archmesa	60	Well suited		Unsuited	
				Restrictive layer limitation	1.00
Skyute	25	Well suited		Unsuited	
				Restrictive layer limitation	1.00
590:					
Abreu Family	65	Unsuited		Unsuited	
		Slope limitation	1.00	Slope limitation	1.00
		Stoniness limitation	0.50	Stoniness limitation	1.00
600:					
Haplustepts	50	Unsuited		Unsuited	
		Slope limitation	1.00	Slope limitation	1.00
		Stoniness limitation	0.50	Stoniness limitation	0.50
Haplustalfs	35	Unsuited		Unsuited	
		Slope limitation	1.00	Stoniness limitation	1.00
		Stoniness limitation	0.50	Slope limitation	1.00

Table 9.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
13:					
Doakum	---	---	---	---	---
Betonnie	Amur honeysuckle, common lilac, fourwing saltbush, western sandcherry	twoneedle pinyon, Rocky Mountain juniper, eastern redcedar, green ash	Russian olive, Siberian elm, common hackberry, ponderosa pine(woodland)	---	---
18:					
Sparham	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
19:					
Sparham	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
23:					
Teromote	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
24:					
Orlie	Scotch pine, Siberian peashrub, Tatarian honeysuckle, common lilac	American plum, honeylocust, Austrian pine, eastern redcedar, ponderosa pine(woodland)	Russian olive, green ash, Siberian elm	---	---
Sparham	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
40:					
Parkelei	fourwing saltbush	Nanking cherry, common lilac	American plum, twoneedle pinyon, Austrian pine, ponderosa pine(woodland)	Rocky Mountain juniper, common hackberry, green ash	Russian olive, Siberian elm

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
40:					
Menefee	---	---	---	---	---
Vessilla	---	---	---	---	---
64:					
Dula	redosier dogwood	common lilac, skunkbush sumac	American plum, Austrian pine, Scotch pine, eastern redcedar	Rocky Mountain juniper, green ash, white willow	Russian olive, Lombardy poplar
69:					
Pinavetes	common lilac, fourwing saltbush, western sandcherry	twoneedle pinyon, Austrian pine, Rocky Mountain juniper, eastern redcedar, green ash	Russian olive, Siberian elm, honeylocust, ponderosa pine(woodland)	---	---
Florita	common lilac, fourwing saltbush, western sandcherry	twoneedle pinyon, Austrian pine, Rocky Mountain juniper, eastern redcedar, green ash	Russian olive, Siberian elm, honeylocust, ponderosa pine(woodland)	---	---
107:					
Berryman	fourwing saltbush, Amur honeysuckle, Tatarian honeysuckle, skunkbush sumac	Austrian pine, Rocky Mountain juniper, Russian olive, Siberian elm, eastern redcedar, ponderosa pine(woodland)	---	---	---
Ruson	fourwing saltbush, Amur honeysuckle, Tatarian honeysuckle, skunkbush sumac	Austrian pine, Rocky Mountain juniper, Russian olive, Siberian elm, eastern redcedar, ponderosa pine(woodland)	---	---	---
119:					
Roques	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
Nusmag	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
119:					
Orlie	Scotch pine, Siberian peashrub, Tatarian honeysuckle, common lilac	American plum, honeylocust, Austrian pine, eastern redcedar, ponderosa pine(woodland)	Russian olive, green ash, Siberian elm	---	---
214:					
Quimera	Amur honeysuckle, common lilac	oriental arborvitae, twoneedle pinyon	Russian olive, honeylocust	---	---
Ishkoten	Amur honeysuckle, common lilac	oriental arborvitae, twoneedle pinyon	Russian olive, honeylocust	---	---
229:					
Nusmag	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
Tottles	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
231:					
Sparham	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
303:					
Orlie	Scotch pine, Siberian peashrub, Tatarian honeysuckle, common lilac	American plum, honeylocust, Austrian pine, eastern redcedar, ponderosa pine(woodland)	Russian olive, green ash, Siberian elm	---	---
304:					
Orlie	Scotch pine, Siberian peashrub, Tatarian honeysuckle, common lilac	American plum, honeylocust, Austrian pine, eastern redcedar, ponderosa pine(woodland)	Russian olive, green ash, Siberian elm	---	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
304:					
Nalivag	American plum, Scotch pine, Siberian peashrub, Tatarian honeysuckle, common lilac	honeylocust, Austrian pine, eastern redcedar, ponderosa pine(woodland)	Russian olive, green ash, Siberian elm	---	---
350:					
Hosta	Amur honeysuckle, common lilac, fourwing saltbush	skunkbush sumac, Rocky Mountain juniper	Douglas fir(woodland), Russian olive, Siberian elm, eastern redcedar, green ash, ponderosa pine(woodland), Russian mulberry	---	---
370:					
Orlie	Scotch pine, Siberian peashrub, Tatarian honeysuckle, common lilac	American plum, honeylocust, Austrian pine, eastern redcedar, ponderosa pine(woodland)	Russian olive, green ash, Siberian elm	---	---
380:					
Teequee	fourwing saltbush, Amur honeysuckle, Tatarian honeysuckle, skunkbush sumac	Austrian pine, Rocky Mountain juniper, Russian olive, Siberian elm, eastern redcedar, ponderosa pine(woodland)	---	---	---
390:					
Losindios	---	---	---	---	---
Escrito	---	---	---	---	---
Parkelei	fourwing saltbush	Nanking cherry, common lilac	American plum, twoneedle pinyon, Austrian pine, ponderosa pine(woodland)	Rocky Mountain juniper, common hackberry, green ash	Russian olive, Siberian elm
403:					
Vosburg	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
403:					
Millpaw	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
430:					
Wilmac, dry	fourwing saltbush, Amur honeysuckle, Tatarian honeysuckle, skunkbush sumac	Austrian pine, Rocky Mountain juniper, Russian olive, Siberian elm, eastern redcedar, ponderosa pine(woodland)	---	---	---
Hosta	Amur honeysuckle, common lilac, fourwing saltbush	skunkbush sumac, Rocky Mountain juniper	Douglas fir(woodland), Russian olive, Siberian elm, eastern redcedar, green ash, ponderosa pine(woodland), Russian mulberry	---	---
500:					
Escrito	fourwing saltbush, twoneedle pinyon	---	---	---	---
Rock Outcrop	---	---	---	---	---
Dulcepeak	western sandcherry, Rocky Mountain juniper, eastern redcedar, fourwing saltbush, green ash, skunkbush sumac, twoneedle pinyon	Austrian pine, Russian olive, Siberian elm, ponderosa pine(woodland), honeylocust	---	---	---
501:					
Zau	American plum, Siberian peashrub, Tatarian honeysuckle, common lilac	Scotch pine, Rocky Mountain juniper	Austrian pine, eastern redcedar, honeylocust, Russian olive, green ash	Siberian elm	---
Lomapedro	American plum, Siberian peashrub, Tatarian honeysuckle, common lilac	Scotch pine, Rocky Mountain juniper	Austrian pine, eastern redcedar, honeylocust, Russian olive, green ash	Siberian elm	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
523:					
Suposo	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
Ohwiler	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
524:					
Jicarilla	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
Ohwiler	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
530:					
Wilmac	Amur honeysuckle, common lilac	twoneedle pinyon	Russian olive, honeylocust, ponderosa pine(woodland)	---	---
Hosta	Amur honeysuckle, common lilac, fourwing saltbush	skunkbush sumac, Rocky Mountain juniper	Douglas fir(woodland), Russian olive, Siberian elm, eastern redcedar, green ash, ponderosa pine(woodland), Russian mulberry	---	---
Millpaw	Tatarian honeysuckle, common lilac	American plum, skunkbush sumac, Rocky Mountain juniper, Scotch pine, eastern redcedar	Austrian pine, Russian olive, Siberian elm, green ash, Russian mulberry	---	---
531:					
Horselake	Amur honeysuckle, common lilac	twoneedle pinyon	Russian olive, honeylocust, ponderosa pine(woodland)	---	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
531:					
Menefee	---	---	---	---	---
540:					
Ishkoten	American plum, Siberian peashrub, Tatarian honeysuckle, common lilac	Scotch pine, Rocky Mountain juniper	Austrian pine, eastern redcedar, honeylocust, Russian olive, green ash	Siberian elm	---
Lajuita	fourwing saltbush, twoneedle pinyon	---	---	---	---
Escrito	fourwing saltbush, twoneedle pinyon	---	---	---	---
541:					
Ishkoten	American plum, Siberian peashrub, Tatarian honeysuckle, common lilac	Scotch pine, Rocky Mountain juniper	Austrian pine, eastern redcedar, honeylocust, Russian olive, green ash	Siberian elm	---
Lajuita	fourwing saltbush, twoneedle pinyon	---	---	---	---
560:					
Herm	American plum, Siberian peashrub, common lilac	Scotch pine, Tatarian honeysuckle	Austrian pine, eastern redcedar, honeylocust, ponderosa pine(woodland), Russian olive, green ash	Siberian elm	---
Dulcepeak	western sandcherry, Rocky Mountain juniper, eastern redcedar, fourwing saltbush, green ash, skunkbush sumac, twoneedle pinyon	Austrian pine, Russian olive, Siberian elm, ponderosa pine(woodland), honeylocust	---	---	---
571:					
Orlie	Scotch pine, Siberian peashrub, Tatarian honeysuckle, common lilac	American plum, honeylocust, Austrian pine, eastern redcedar, ponderosa pine(woodland)	Russian olive, green ash, Siberian elm	---	---
Cementlake	---	---	---	---	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
580:					
Archmesa	American plum, Siberian peashrub, Tatarian honeysuckle, common lilac	Scotch pine, Rocky Mountain juniper	Austrian pine, eastern redcedar, honeylocust, Russian olive, green ash	Siberian elm	---
Skyute	---	---	---	---	---

Table 10a.--Recreation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5:							
Water	85	Not rated		Not rated		Not rated	
6:							
Miscellaneous Water	85	Not rated		Not rated		Not rated	
10:							
Elias	45	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00	Restricted permeability	0.41	Restricted permeability	0.41
		Restricted permeability	0.41			Slope	0.05
Canyada	30	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Too clayey	0.50
		Too clayey	0.50	Restricted permeability	0.41	Restricted permeability	0.41
		Restricted permeability	0.41			Slope	0.05
Sparank	20	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	0.39	Restricted permeability	0.39
		Restricted permeability	0.39				
13:							
Doakum	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.77
						Dusty	0.50
Betonnie	45	Not limited		Not limited		Somewhat limited	
						Slope	0.05
18:							
Sparham	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Flooding	0.60
		Too clayey	0.50	Restricted permeability	0.45	Too clayey	0.50
		Restricted permeability	0.45			Restricted permeability	0.45
						Gravel content	0.06
						Slope	0.05

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
19:							
Sparham	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Flooding	0.60
		Dusty	0.50	Restricted permeability	0.45	Dusty	0.50
		Restricted permeability	0.45			Restricted permeability	0.45
						Gravel content	0.06
						Slope	0.05
20:							
Menefee	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
Vessilla	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
Rock Outcrop	20	Not rated		Not rated		Not rated	
21:							
Badland	35	Not rated		Not rated		Not rated	
Menefee	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
Rock Outcrop	20	Not rated		Not rated		Not rated	
23:							
Teromote	85	Not limited		Not limited		Somewhat limited	
						Slope	0.05
24:							
Orlie	45	Not limited		Not limited		Somewhat limited	
						Slope	0.21
						Gravel content	0.06
Sparham	35	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too clayey	0.50	Too clayey	0.50
		Too clayey	0.50	Restricted permeability	0.45	Restricted permeability	0.45
		Restricted permeability	0.45			Gravel content	0.06
32:							
Doakum	85	Not limited		Not limited		Somewhat limited	
						Slope	0.21

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40:							
Parkelei	45	Not limited		Not limited		Somewhat limited	
						Slope	0.94
Menefee	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
Vessilla	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.04	Slope	0.04	Slope	1.00
64:							
Dula	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
		Depth to saturated zone	0.08	Depth to saturated zone	0.03	Depth to saturated zone	0.08
69:							
Pinavetes	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.28	Too sandy	0.28	Slope	0.94
						Too sandy	0.28
Florita	40	Not limited		Not limited		Somewhat limited	
						Slope	0.21
70:							
Blancot	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.21
Councelor	30	Not limited		Not limited		Somewhat limited	
						Slope	0.48
Tsosie	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Salinity	0.50	Salinity	0.50	Salinity	0.50
						Slope	0.05
104:							
Doakum	60	Not limited		Not limited		Somewhat limited	
						Slope	0.21
Oro	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Slope	0.05

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
105:							
Badland	50	Not rated		Not rated		Not rated	
Menefee	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
107:							
Berryman	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Slope	0.94
						Restricted permeability	0.41
Ruson	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.41	Restricted permeability	0.41	Restricted permeability	0.41
						Gravel content	0.06
						Slope	0.05
108:							
Peney	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Gravel content	1.00
		Gravel content	0.68	Gravel content	0.68	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	1.00
		Restricted permeability	0.45	Restricted permeability	0.45	Restricted permeability	0.45
Ransect	35	Not limited		Not limited		Somewhat limited	
						Slope	0.48
						Depth to bedrock	0.42
115:							
Menefee	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Dusty	0.50
		Gravel content	0.11	Gravel content	0.11	Restricted permeability	0.44
119:							
Roques	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.45	Restricted permeability	0.45	Slope	0.77
						Restricted permeability	0.45

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
119:							
Nusmag	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.45	Restricted permeability	0.45	Restricted permeability	0.45
						Slope	0.05
136:							
Elpedro	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.21
155:							
Vessilla	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Content of large stones	0.01
Menefee	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
Orlie	20	Not limited		Not limited		Somewhat limited	
						Slope	0.77
156:							
Lindrith	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.77
						Dusty	0.50
Royosa	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.28	Too sandy	0.28	Slope	0.77
						Too sandy	0.28
214:							
Quimera	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Gravel content	1.00
		Gravel content	1.00	Gravel content	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Ishkoten	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.39	Restricted permeability	0.39	Depth to bedrock	0.90
						Restricted permeability	0.39

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
220:							
Skyvillage	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
						Content of large stones	0.01
Eslendo	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
Rock Outcrop	30	Not rated		Not rated		Not rated	
229:							
Nusmag	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.45	Restricted permeability	0.45	Restricted permeability	0.45
						Slope	0.05
Tottles	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
		Depth to saturated zone	0.86	Depth to saturated zone	0.48	Depth to saturated zone	0.86
231:							
Sparham	85	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Salinity	1.00	Salinity	1.00	Salinity	1.00
		Flooding	1.00	Restricted permeability	0.45	Restricted permeability	0.45
		Restricted permeability	0.45			Gravel content	0.06
						Slope	0.05
303:							
Orlie	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
						Gravel content	0.06
304:							
Orlie	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.77
						Dusty	0.50
						Gravel content	0.06
Nalivag	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.21

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
310:							
Rock Outcrop	40	Not rated		Not rated		Not rated	
Vessilla	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Menefee	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
						Content of large stones	0.08
340:							
Riverwash	50	Not rated		Not rated		Not rated	
Kwakina	20	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.28	Flooding	0.60
		Too sandy	0.28			Too sandy	0.28
Tapicito	20	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Dusty	0.50	Dusty	0.50
		Dusty	0.50				
350:							
Hosta	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.41	Restricted permeability	0.41	Restricted permeability	0.41
						Slope	0.21
370:							
Orlie	85	Not limited		Not limited		Somewhat limited	
						Slope	0.77
380:							
Teequee	60	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.39	Restricted permeability	0.39	Slope	1.00
		Slope	0.16	Slope	0.16	Content of large stones	1.00
		Content of large stones	0.08	Content of large stones	0.08	Restricted permeability	0.39
						Gravel content	0.08

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
380:							
Menefee	15	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	1.00
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
Vessilla	15	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	1.00
						Content of large stones	0.01
390:							
Losindios	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Escrito	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
						Content of large stones	0.20
Parkelei	25	Not limited		Not limited		Somewhat limited	
						Slope	0.94
403:							
Vosburg	55	Not limited		Not limited		Somewhat limited	
						Slope	0.94
Millpaw	35	Not limited		Not limited		Somewhat limited	
						Slope	0.48
421:							
Argiustolls	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of large stones	1.00
		Content of large stones	0.50	Content of large stones	0.50	Slope	1.00
		Too Stony	0.19	Too Stony	0.19	Depth to bedrock	1.00
						Too Stony	0.19
						Gravel content	0.06
Ustorthents	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.74	Content of large stones	0.74	Content of large stones	1.00
						Depth to bedrock	0.29
						Gravel content	0.14
Rock Outcrop	15	Not rated		Not rated		Not rated	

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
430:							
Wilmac, dry	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.44	Restricted permeability	0.44	Slope	0.94
						Restricted permeability	0.44
						Depth to bedrock	0.42
						Content of large stones	0.01
Hosta	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.39	Restricted permeability	0.39	Slope	0.48
						Restricted permeability	0.39
440:							
Losindios	60	Not limited		Not limited		Very limited	
						Slope	1.00
Jaythree	20	Not limited		Not limited		Somewhat limited	
						Slope	0.21
452:							
Gojiya	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	0.50
		Restricted permeability	0.41	Restricted permeability	0.41	Restricted permeability	0.41
						Slope	0.21
500:							
Escrito	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock Outcrop	20	Not rated		Not rated		Not rated	
Dulcepeak	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.41	Restricted permeability	0.41	Depth to bedrock	0.84
						Restricted permeability	0.41
501:							
Zau	55	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Slope	1.00
		Slope	0.04	Slope	0.04	Depth to bedrock	0.42
						Restricted permeability	0.41

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
501:							
Lomapedro	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Slope	0.77
						Restricted permeability	0.41
515:							
Ustorthents	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Too Stony	0.01	Too Stony	0.01	Depth to bedrock	0.65
						Too Stony	0.01
Rock Outcrop	30	Not rated		Not rated		Not rated	
523:							
Suposo	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Slope	0.77
						Restricted permeability	0.41
Ohwiler	40	Not limited		Not limited		Somewhat limited	
						Slope	0.77
524:							
Jicarilla	50	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	0.96	Restricted permeability	0.96
		Restricted permeability	0.96			Slope	0.48
		Depth to saturated zone	0.01			Depth to saturated zone	0.01
Ohwiler	35	Not limited		Not limited		Somewhat limited	
						Slope	0.94
525:							
Jaythree	65	Not limited		Not limited		Very limited	
						Slope	1.00
Cedarsprings	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.39	Restricted permeability	0.39	Slope	0.77
						Restricted permeability	0.39

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
526:							
Hetz	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	0.50	Depth to saturated zone	0.22	Depth to saturated zone	0.50
		Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
530:							
Wilmac	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Slope	0.77
		Restricted permeability	0.39	Restricted permeability	0.39	Dusty	0.50
						Depth to bedrock	0.42
						Restricted permeability	0.39
						Content of large stones	0.01
Hosta	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.41	Restricted permeability	0.41	Restricted permeability	0.41
						Slope	0.21
Millpaw	15	Not limited		Not limited		Somewhat limited	
						Slope	0.05
531:							
Horselake	50	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.44	Restricted permeability	0.44	Slope	1.00
						Restricted permeability	0.44
Menefee	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Dusty	0.50	Dusty	0.50	Dusty	0.50
		Restricted permeability	0.44	Restricted permeability	0.44	Restricted permeability	0.44
533:							
Badland	90	Not rated		Not rated		Not rated	
540:							
Ishkoten	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.39	Restricted permeability	0.39	Restricted permeability	0.39
						Depth to bedrock	0.16

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
540:							
Lajuita	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Escrito	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
541:							
Ishkoten	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.39	Restricted permeability	0.39	Depth to bedrock	0.65
						Restricted permeability	0.39
Lajuita	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
552:							
Haplustalfs	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too Stony	0.60	Too Stony	0.60	Too Stony	0.60
Argiustolls	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too Stony	0.60	Too Stony	0.60	Too Stony	0.60
553:							
Haplustalfs	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too Stony	0.76	Too Stony	0.76	Too Stony	0.76
Ustorthents	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of large stones	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Content of large stones	0.98	Content of large stones	0.98	Depth to bedrock	1.00
		Too Stony	0.76	Too Stony	0.76	Too Stony	0.76
						Gravel content	0.01
560:							
Herm	45	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.41	Restricted permeability	0.41	Slope	1.00
						Restricted permeability	0.41

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
560:							
Dulcepeak	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of large stones	1.00
		Content of large stones	0.68	Content of large stones	0.68	Slope	1.00
		Restricted permeability	0.41	Restricted permeability	0.41	Depth to bedrock	0.80
						Restricted permeability	0.41
						Gravel content	0.01
571:							
Orlie	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Dusty	0.50
						Slope	0.48
						Gravel content	0.06
Cementlake	35	Very limited		Very limited		Very limited	
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Restricted permeability	0.39	Restricted permeability	0.39	Slope	0.48
						Restricted permeability	0.39
580:							
Archmesa	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.16	Slope	0.16	Slope	1.00
						Depth to bedrock	0.10
						Content of large stones	0.08
Skyute	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	0.16	Slope	0.16	Depth to bedrock	1.00
						Content of large stones	0.08
590:							
Abreu Family	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of large stones	1.00
		Content of large stones	0.92	Content of large stones	0.92	Slope	1.00
						Depth to bedrock	1.00
						Gravel content	0.14
Rubbleland	15	Not rated		Not rated		Not rated	
Rock Outcrop	15	Not rated		Not rated		Not rated	

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
600:							
Haplustepts	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too Stony	0.26	Too Stony	0.26	Too Stony	0.26
Haplustalfs	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too Stony	0.94	Too Stony	0.94	Too Stony	0.94
		Restricted permeability	0.41	Restricted permeability	0.41	Restricted permeability	0.41

Table 10b.--Recreation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5:							
Water	85	Not rated		Not rated		Not rated	
6:							
Miscellaneous Water	85	Not rated		Not rated		Not rated	
10:							
Elias	45	Not limited		Not limited		Very limited	
						Sodium content	1.00
Canyada	30	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
Sparank	20	Not limited		Not limited		Not limited	
13:							
Doakum	45	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Betonnie	45	Not limited		Not limited		Not limited	
18:							
Sparham	85	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
						Flooding	0.60
19:							
Sparham	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Flooding	0.60
20:							
Menefee	35	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
Vessilla	30	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
Rock Outcrop	20	Not rated		Not rated		Not rated	

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
21:							
Badland	35	Not rated		Not rated		Not rated	
Menefee	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Droughty	1.00
						Depth to bedrock	1.00
Rock Outcrop	20	Not rated		Not rated		Not rated	
23:							
Teromote	85	Not limited		Not limited		Not limited	
24:							
Orlie	45	Not limited		Not limited		Not limited	
Sparham	35	Somewhat limited		Somewhat limited		Very limited	
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
32:							
Doakum	85	Not limited		Not limited		Not limited	
40:							
Parkelei	45	Not limited		Not limited		Not limited	
Menefee	20	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
Vessilla	20	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Slope	0.04
64:							
Dula	85	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
						Depth to saturated zone	0.03
69:							
Pinavetes	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.28	Too sandy	0.28	Droughty	0.91
Florita	40	Not limited		Not limited		Not limited	
70:							
Blancot	30	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Councelor	30	Not limited		Not limited		Not limited	

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70:							
Tsosie	30	Not limited		Not limited		Somewhat limited	
						Salinity	0.50
104:							
Doakum	60	Not limited		Not limited		Not limited	
Oro	25	Not limited		Not limited		Not limited	
105:							
Badland	50	Not rated		Not rated		Not rated	
Menefee	30	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	1.00	Dusty	0.50	Droughty	1.00
		Dusty	0.50			Depth to bedrock	1.00
107:							
Berryman	55	Not limited		Not limited		Very limited	
						Carbonate content	1.00
Ruson	30	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
108:							
Peney	50	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Gravel content	0.68
						Slope	0.63
Ransect	35	Not limited		Not limited		Very limited	
						Carbonate content	1.00
						Depth to bedrock	0.42
115:							
Menefee	85	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	1.00
		Slope	0.32			Slope	1.00
						Droughty	0.98
						Gravel content	0.11
						Content of large stones	0.01
119:							
Roques	45	Not limited		Not limited		Not limited	
Nusmag	35	Not limited		Not limited		Not limited	
136:							
Elpedro	85	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
155:							
Vessilla	45	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
						Content of large stones	0.01
Menefee	25	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Depth to bedrock	1.00
						Slope	1.00
						Droughty	1.00
Orlie	20	Not limited		Not limited		Not limited	
156:							
Lindrith	50	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Royosa	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.28	Too sandy	0.28	Droughty	0.69
214:							
Quimera	60	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
						Gravel content	1.00
						Depth to bedrock	1.00
						Droughty	0.85
Ishkoten	25	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Content of organic matter	1.00
		Slope	0.92			Slope	1.00
						Depth to bedrock	0.90
						Droughty	0.35
220:							
Skyvillage	30	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Slope	0.16
						Content of large stones	0.01
Eslendo	30	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
						Droughty	0.87
						Slope	0.16
Rock Outcrop	30	Not rated		Not rated		Not rated	

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
229:							
Nusmag	45	Not limited		Not limited		Not limited	
Tottles	35	Somewhat limited Depth to saturated zone	0.11	Somewhat limited Depth to saturated zone	0.11	Somewhat limited Depth to saturated zone	0.48
231:							
Sparham	85	Not limited		Not limited		Very limited Salinity Sodium content Droughty	1.00 1.00 0.09
303:							
Orlie	85	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
304:							
Orlie	45	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
Nalivag	35	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
310:							
Rock Outcrop	40	Very limited Slope Water erosion	1.00 1.00	Very limited Water erosion Slope	1.00 0.22	Very limited Depth to bedrock Slope	1.00 1.00
Vessilla	30	Somewhat limited Slope	0.50	Not limited		Very limited Slope Droughty Depth to bedrock	1.00 1.00 1.00
Menefee	20	Very limited Water erosion Slope Dusty	1.00 0.50 0.50	Very limited Water erosion Dusty	1.00 0.50	Very limited Slope Droughty Depth to bedrock Content of large stones	1.00 1.00 1.00 0.08
340:							
Riverwash	50	Not rated		Not rated		Not rated	
Kwakina	20	Somewhat limited Too sandy	0.28	Somewhat limited Too sandy	0.28	Somewhat limited Droughty Flooding	0.69 0.60
Tapicito	20	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	
350:							
Hosta	85	Somewhat limited Dusty	0.50	Somewhat limited Dusty	0.50	Not limited	

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
370:							
Orlie	85	Not limited		Not limited		Not limited	
380:							
Teequee	60	Somewhat limited		Somewhat limited		Very limited	
		Content of large stones	0.08	Content of large stones	0.08	Content of large stones	1.00
						Slope	0.16
Menefee	15	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	1.00
						Slope	0.84
Vessilla	15	Not limited		Not limited		Very limited	
						Droughty	1.00
						Depth to bedrock	1.00
						Slope	0.84
						Content of large stones	0.01
390:							
Losindios	35	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Content of organic matter	1.00
						Slope	1.00
Escrito	30	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.94
						Content of large stones	0.20
						Slope	0.16
Parkelei	25	Not limited		Not limited		Not limited	
403:							
Vosburg	55	Not limited		Not limited		Not limited	
Millpaw	35	Not limited		Not limited		Not limited	
421:							
Argiustolls	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.50	Content of large stones	0.50	Content of large stones	1.00
		Too Stony	0.19	Too Stony	0.19	Droughty	1.00
						Depth to bedrock	1.00

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
421:							
Ustorthents	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.74	Content of large stones	0.74	Content of large stones	1.00
						Droughty	0.87
						Depth to bedrock	0.29
Rock Outcrop	15	Not rated		Not rated		Not rated	
430:							
Wilmac, dry	55	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.42
						Content of large stones	0.01
Hosta	35	Not limited		Not limited		Not limited	
440:							
Losindios	60	Not limited		Not limited		Very limited	
						Content of organic matter	1.00
Jaythree	20	Not limited		Not limited		Very limited	
						Content of organic matter	1.00
452:							
Gojiya	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Too clayey	0.50	Too clayey	0.50	Too clayey	1.00
500:							
Escrito	45	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Content of organic matter	1.00
						Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.96
Rock Outcrop	20	Not rated		Not rated		Not rated	
Dulcepeak	20	Not limited		Not limited		Very limited	
						Slope	1.00
						Depth to bedrock	0.84
						Droughty	0.05
501:							
Zau	55	Not limited		Not limited		Somewhat limited	
						Depth to bedrock	0.42
						Droughty	0.14
						Slope	0.04

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
501:							
Lomapedro	35	Not limited		Not limited		Not limited	
515:							
Ustorthents	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Droughty	1.00
		Too Stony	0.01	Too Stony	0.01	Content of large stones	1.00
						Depth to bedrock	0.65
Rock Outcrop	30	Not rated		Not rated		Not rated	
523:							
Suposo	45	Not limited		Not limited		Not limited	
Ohwiler	40	Not limited		Not limited		Not limited	
524:							
Jicarilla	50	Not limited		Not limited		Not limited	
Ohwiler	35	Not limited		Not limited		Not limited	
525:							
Jaythree	65	Not limited		Not limited		Very limited	
						Content of organic matter	1.00
Cedarsprings	25	Not limited		Not limited		Very limited	
						Content of organic matter	1.00
526:							
Hetz	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
						Depth to saturated zone	0.22
530:							
Wilmac	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Dusty	0.50	Dusty	0.50	Depth to bedrock	0.42
						Content of large stones	0.01
Hosta	25	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Millpaw	15	Not limited		Not limited		Not limited	
531:							
Horselake	50	Not limited		Not limited		Not limited	

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
531:							
Menefee	30	Somewhat limited		Somewhat limited		Very limited	
		Dusty	0.50	Dusty	0.50	Droughty	1.00
						Depth to bedrock	1.00
						Slope	1.00
533:							
Badland	90	Not rated		Not rated		Not rated	
540:							
Ishkoten	45	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	1.00	Slope	0.78	Content of organic matter	1.00
						Depth to bedrock	0.16
Lajuita	25	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
						Content of organic matter	1.00
						Droughty	1.00
Escrito	20	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
						Content of organic matter	1.00
						Depth to bedrock	1.00
						Droughty	0.93
541:							
Ishkoten	55	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	1.00	Slope	0.78	Content of organic matter	1.00
						Depth to bedrock	0.65
						Droughty	0.01
Lajuita	30	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	1.00			Content of organic matter	1.00
						Droughty	1.00
						Depth to bedrock	1.00
552:							
Haplustalfs	40	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Content of organic matter	1.00
		Too Stony	0.60	Too Stony	0.60	Droughty	0.43

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
552:							
Argiustolls	30	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Content of organic matter	1.00
		Too Stony	0.60	Too Stony	0.60	Droughty	0.11
553:							
Haplustalfs	55	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Content of organic matter	1.00
		Too Stony	0.76	Too Stony	0.76	Droughty	0.81
Ustorthents	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.98	Content of large stones	0.98	Content of large stones	1.00
		Too Stony	0.76	Too Stony	0.76	Droughty	1.00
						Depth to bedrock	1.00
560:							
Herm	45	Not limited		Not limited		Not limited	
Dulcepeak	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Content of large stones	0.68	Content of large stones	1.00
		Content of large stones	0.68			Slope	1.00
						Depth to bedrock	0.80
						Droughty	0.06
571:							
Orlie	50	Somewhat limited		Somewhat limited		Not limited	
		Dusty	0.50	Dusty	0.50		
Cementlake	35	Not limited		Not limited		Very limited	
						Sodium content	1.00
580:							
Archmesa	60	Not limited		Not limited		Somewhat limited	
						Slope	0.16
						Depth to bedrock	0.10
						Content of large stones	0.08

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
580:							
Skyute	25	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.53
						Slope	0.16
						Content of large stones	0.08
590:							
Abreu Family	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.92	Content of large stones	0.92	Content of large stones	1.00
						Depth to bedrock	1.00
						Droughty	0.01
Rubbleland	15	Not rated		Not rated		Not rated	
Rock Outcrop	15	Not rated		Not rated		Not rated	
600:							
Haplustepts	50	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Content of organic matter	1.00
		Too Stony	0.26	Too Stony	0.26		
Haplustalfs	35	Very limited		Very limited		Very limited	
		Slope	1.00	Water erosion	1.00	Slope	1.00
		Water erosion	1.00	Slope	1.00	Content of organic matter	1.00
		Too Stony	0.94	Too Stony	0.94	Droughty	0.36

Table 11.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
5:												
Water	---	---	---	---	---	---	---	---	---	---	---	---
6:												
Miscellaneous Water	---	---	---	---	---	---	---	---	---	---	---	---
10:												
Elias	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor
Canyada	---	---	Poor	---	---	Poor	---	---	Very poor	Very poor	Very poor	Poor
Sparank	Very poor	Very poor	Very poor	---	---	Poor	Poor	Very poor	Very poor	---	Very poor	Very poor
13:												
Doakum	Very poor	Very poor	Poor	---	---	Poor	Poor	Very poor	Very poor	---	Very poor	Poor
Betonnie	Very poor	Very poor	Poor	---	Poor	Fair	Poor	Poor	Very poor	Poor	Poor	Poor
18:												
Sparham	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
19:												
Sparham	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
20:												
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor
Vessilla	Very poor	Very poor	Fair	---	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
21:												
Badland	---	---	---	---	---	---	---	---	---	---	---	---
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
23:												
Teromote	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
24:												
Orlie	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Sparham	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
32:												
Doakum	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
40:												
Parkelei	Poor	Fair	Good	---	Good	Good	Poor	Very poor	Fair	Good	Very poor	Good
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor
Vessilla	Very poor	Very poor	Fair	---	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
64:												
Dula	Poor	Fair	Poor	---	Fair	Fair	Good	Fair	Poor	Fair	Fair	Fair
69:												
Pinavetes	Very poor	Very poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
Florita	Very poor	Poor	Fair	---	---	Fair	Very poor	Very poor	Poor	---	Very poor	Fair
70:												
Blancot	Poor	Poor	Fair	---	---	Fair	Poor	Very poor	Poor	---	Very poor	Fair
Councelor	Very poor	Very poor	Poor	---	Poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Very poor
Tsosie	Very poor	Very poor	Poor	---	Poor	Poor	Poor	Very poor	Very poor	Poor	Very poor	Poor
104:												
Doakum	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Oro	Poor	Poor	Fair	---	Fair	Poor	Poor	Very poor	Poor	Fair	Very poor	Poor
105:												
Badland	---	---	---	---	---	---	---	---	---	---	---	---
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
107:												
Berryman	Poor	Fair	Fair	---	Poor	Good	Poor	Very poor	Poor	Poor	Very poor	Fair
Ruson	Poor	Fair	Fair	---	Poor	Good	Poor	Very poor	Poor	Poor	Very poor	Fair
108:												
Peney	Poor	Fair	Good	---	Good	Good	Poor	Very poor	Fair	Good	Very poor	Good
Ransect	Poor	Fair	Good	---	Good	Good	Poor	Very poor	Fair	Good	Very poor	Good
115:												
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor
119:												
Roques	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Nusmag	Fair	Fair	Fair	---	---	Fair	Poor	Poor	Fair	---	Poor	Fair
136:												
Elpedro	Poor	Fair	Good	---	Good	Fair	Poor	Very poor	Fair	Good	Very poor	Fair
155:												
Vessilla	Very poor	Very poor	Poor	---	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor
Orlie	Fair	Good	Fair	---	Good	Fair	Poor	Very poor	Fair	---	Very poor	Fair
156:												
Lindrith	Poor	Fair	Fair	---	---	Fair	---	---	Fair	Very poor	Very poor	Fair
Royosa	Poor	Fair	Fair	---	Poor	Fair	Very poor	Very poor	Fair	Poor	Very poor	Fair
214:												
Quimera	Very poor	Very poor	Fair	---	---	Good	Very poor	Very poor	Poor	---	Very poor	Fair
Ishkoten	Poor	Poor	Fair	---	Fair	Fair	Very poor	Poor	Poor	Fair	Very poor	Fair
220:												
Skyvillage	Very poor	Very poor	Very poor	---	---	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Poor

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
220:												
Eslendo	Very poor	Very poor	Poor	---	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Poor
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
229:												
Nusmag	Fair	Fair	Fair	---	---	Fair	Poor	Poor	Fair	---	Poor	Fair
Tottles	Poor	Fair	Poor	---	---	Poor	Good	Fair	Poor	---	Fair	Poor
231:												
Sparham	Poor	Fair	Very poor	---	---	Very poor	Poor	Very poor	Poor	---	Very poor	Very poor
303:												
Orlie	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
304:												
Orlie	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Nalivag	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
310:												
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
Vessilla	Very poor	Very poor	Fair	---	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor
340:												
Riverwash	Very poor	Very poor	Very poor	--- ---	Very poor	Very poor	Very poor	Poor	Very poor	Very poor	Poor	Very poor
Kwakina	Poor	Poor	Fair	---	---	Fair	Poor	Poor	Poor	---	---	Fair
Tapicito	Poor	Poor	Very poor	--- ---	Very poor	Very poor	Poor	Poor	Poor	Very poor	Poor	Very poor
350:												
Hosta	Poor	Fair	Fair	---	---	Fair	Poor	Poor	Fair	---	Poor	Fair
370:												
Orlie	Fair	Good	Fair	---	Good	Fair	Poor	Very poor	Fair	---	Very poor	Fair

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
380:												
Teequee	Poor	Poor	Fair	---	Good	Fair	Very poor	Very poor	Poor	Fair	---	Fair
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor
Vessilla	Very poor	Very poor	Poor	---	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Poor
390:												
Losindios	Poor	Fair	Good	---	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
Escrito	Very poor	Poor	Fair	---	Fair	Fair	---	---	Fair	Fair	---	Fair
Parkelei	Poor	Fair	Fair	---	Good	Good	Poor	Very poor	Fair	Good	Very poor	Good
403:												
Vosburg	Poor	Poor	Good	---	Good	Good	Poor	Very poor	Fair	Good	Very poor	Good
Millpaw	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
421:												
Argiustolls	Very poor	Very poor	Very poor	---	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor	Poor
Ustorthents	Very poor	Very poor	Very poor	---	Poor	Fair	Very poor	Very poor	Poor	Very poor	Very poor	Poor
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
430:												
Wilmac, dry	Very poor	Poor	Good	---	Good	Good	---	---	Poor	Good	---	Good
Hosta	Poor	Fair	Fair	---	---	Fair	Poor	Poor	Fair	---	Very poor	Fair
440:												
Losindios	Poor	Fair	Good	---	Good	Good	Very poor	Very poor	Fair	Fair	Very poor	Good
Jaythree	Very poor	Very poor	Fair	---	Good	Good	Very poor	Very poor	Poor	Fair	Very poor	Fair
452:												
Gojiya	Poor	Fair	Poor	---	---	Poor	Good	Poor	Poor	---	Fair	Poor

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
500:												
Escrito	Very poor	Poor	Fair	---	Fair	Fair	---	---	Fair	Fair	---	Fair
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
Dulcepeak	---	---	Good	---	Good	Good	---	---	Good	Good	---	Good
501:												
Zau	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Lomapedro	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
515:												
Ustorthents	Very poor	Very poor	Very poor	---	Poor	Fair	Very poor	Very poor	Poor	Very poor	Very poor	Poor
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
523:												
Suposo	Poor	Fair	Fair	---	---	Good	Poor	Very poor	Fair	---	Very poor	Fair
Ohwiler	Poor	Poor	Good	---	---	Good	Poor	Very poor	Fair	---	Very poor	Good
524:												
Jicarilla	Poor	Fair	Good	---	---	Good	Fair	Fair	Fair	---	Poor	Good
Ohwiler	Poor	Poor	Good	---	---	Good	Poor	Very poor	Fair	---	Very poor	Good
525:												
Jaythree	Very poor	Very poor	Fair	---	Good	Good	Very poor	Very poor	Poor	Fair	Very poor	Fair
Cedarsprings	Poor	Fair	Fair	---	Good	Fair	Poor	Poor	Fair	Good	Poor	Fair
526:												
Hetz	Fair	Fair	Good	---	---	Good	Good	Fair	Fair	---	Fair	Good
530:												
Wilmac	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Hosta	Fair	Fair	Fair	---	---	Fair	Poor	Poor	Fair	---	Poor	Fair
Millpaw	Fair	Good	Fair	---	---	Fair	Poor	Poor	Fair	---	Poor	Fair
531:												
Horselake	Poor	Fair	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
531:												
Menefee	Very poor	Very poor	Poor	---	Very poor	Poor	Very poor	Very poor	Very poor	Poor	Very poor	Poor
533:												
Badland	---	---	---	---	---	---	---	---	---	---	---	---
540:												
Ishkoten	Very poor	Very poor	Fair	---	Good	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Lajuita	Very poor	Very poor	Fair	---	Poor	Fair	Very poor	Very poor	Very poor	Fair	Very poor	Fair
Escrito	Very poor	Poor	Fair	---	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor	Fair
541:												
Ishkoten	Very poor	Very poor	Fair	---	Good	Fair	Very poor	Very poor	Poor	Fair	Very poor	Fair
Lajuita	Very poor	Very poor	Poor	---	Poor	Fair	Very poor	Very poor	Very poor	Poor	Very poor	Poor
552:												
Haplustalfs	Very poor	Very poor	Very poor	---	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor	Poor
Argiustolls	Very poor	Very poor	Very poor	---	Good	Fair	Very poor	Very poor	Poor	Fair	Very poor	Poor
553:												
Haplustalfs	Very poor	Very poor	Very poor	---	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor	Poor
Ustorthents	Very poor	Very poor	Very poor	---	Poor	Fair	Very poor	Very poor	Poor	Poor	Very poor	Poor
560:												
Herm	Poor	Fair	Good	---	---	Good	Very poor	Very poor	Fair	---	Very poor	Good
Dulcepeak	---	---	Good	---	Good	Good	---	---	Good	Good	---	Good
571:												
Orlie	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Cementlake	Poor	Poor	Very poor	---	---	Very poor	Poor	Very poor	Poor	---	Very poor	Very poor
580:												
Archmesa	Poor	Fair	Good	---	Good	Fair	Very poor	Very poor	Fair	Good	Very poor	Fair

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
580:												
Skyute	Very poor	Very poor	Fair	---	Poor	Fair	Very poor	Very poor	Poor	Poor	Very poor	Fair
590:												
Abreu Family	Very poor	Very poor	Very poor	---	Good	Fair	Very poor	Very poor	Very poor	Fair	Very poor	Poor
Rubbleland	---	---	---	---	---	---	---	---	---	---	---	---
Rock Outcrop	---	---	---	---	---	---	---	---	---	---	---	---
600:												
Haplustepts	Very poor	Very poor	Very poor	---	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor	Poor
Haplustalfs	Very poor	Very poor	Very poor	---	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor	Poor

Table 12a.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5:							
Water	85	Not rated		Not rated		Not rated	
6:							
Miscellaneous Water	85	Not rated		Not rated		Not rated	
10:							
Elias	45	Very limited Flooding	 1.00	Very limited Flooding	 1.00	Very limited Flooding	 1.00
Canyada	30	Very limited Flooding	 1.00	Very limited Flooding	 1.00	Very limited Flooding	 1.00
Sparank	20	Very limited Flooding Shrink-swell	 1.00 0.50	Very limited Flooding Shrink-swell	 1.00 0.50	Very limited Flooding Shrink-swell	 1.00 0.50
13:							
Doakum	45	Not limited		Not limited		Somewhat limited Slope	 0.12
Betonnie	45	Not limited		Not limited		Not limited	
18:							
Sparham	85	Very limited Flooding Shrink-swell	 1.00 1.00	Very limited Flooding Shrink-swell	 1.00 1.00	Very limited Flooding Shrink-swell	 1.00 1.00
19:							
Sparham	85	Very limited Flooding Shrink-swell	 1.00 1.00	Very limited Flooding Shrink-swell	 1.00 1.00	Very limited Flooding Shrink-swell	 1.00 1.00
20:							
Menefee	35	Very limited Slope Depth to soft bedrock	 1.00 1.00	Very limited Depth to soft bedrock Slope	 1.00 1.00	Very limited Slope Depth to soft bedrock	 1.00 1.00
Vessilla	30	Very limited Depth to hard bedrock Slope	 1.00 1.00	Very limited Depth to hard bedrock Slope	 1.00 1.00	Very limited Depth to hard bedrock Slope	 1.00 1.00

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
20:							
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
21:							
Badland	35	Not rated		Not rated		Not rated	
Menefee	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
23:							
Teromote	85	Somewhat limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
24:							
Orlie	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Sparham	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
32:							
Doakum	85	Not limited		Not limited		Not limited	
40:							
Parkelei	45	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
						Slope	0.47
Menefee	20	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to soft bedrock	1.00
Vessilla	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.04	Slope	0.04	Slope	1.00

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
64:							
Dula	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.08	Depth to saturated zone	1.00	Depth to saturated zone	0.08
69:							
Pinavetes	50	Not limited		Not limited		Somewhat limited	
						Slope	0.47
Florita	40	Not limited		Not limited		Not limited	
70:							
Blancot	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Councelor	30	Not limited		Not limited		Not limited	
Tsosie	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
104:							
Doakum	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Oro	25	Very limited		Not limited		Very limited	
		Shrink-swell	1.00			Shrink-swell	1.00
105:							
Badland	50	Not rated		Not rated		Not rated	
Menefee	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
107:							
Berryman	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.47
Ruson	30	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
108:							
Peney	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	1.00

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
108:							
Ransect	35	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
		Depth to hard bedrock	0.42	Shrink-swell	0.50	Depth to hard bedrock	0.42
115:							
Menefee	85	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to soft bedrock	1.00
119:							
Roques	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.12
Nusmag	35	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.24		
136:							
Elpedro	85	Not limited		Not limited		Not limited	
155:							
Vessilla	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Menefee	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to soft bedrock	1.00
Orlie	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
156:							
Lindrith	50	Not limited		Not limited		Somewhat limited	
						Slope	0.12
Royosa	35	Not limited		Not limited		Somewhat limited	
						Slope	0.12

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
214:							
Quimera	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Ishkoten	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Depth to soft bedrock	0.90	Shrink-swell	0.50
				Shrink-swell	0.50		
220:							
Skyvillage	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
Eslendo	30	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Depth to soft bedrock	1.00
		Slope	0.16	Slope	0.16	Shrink-swell	0.50
Rock Outcrop	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
229:							
Nusmag	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.24		
Tottles	35	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.86	Depth to saturated zone	1.00	Depth to saturated zone	0.86
231:							
Sparham	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
303:							
Orlie	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
304:							
Orlie	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
Nalivag	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
310:							
Rock Outcrop	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Vessilla	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Menefee	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
340:							
Riverwash	50	Not rated		Not rated		Not rated	
Kwakina	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.16		
Tapicito	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
350:							
Hosta	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
370:							
Orlie	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
380:							
Teequee	60	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
Menefee	15	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Slope	0.84	Slope	0.84	Depth to soft bedrock	1.00

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
380:							
Vessilla	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	1.00
390:							
Losindios	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
Escrito	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	1.00
Parkelei	25	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
						Slope	0.47
403:							
Vosburg	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.47
Millpaw	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
421:							
Argiustolls	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Ustorthents	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.99	Depth to hard bedrock	1.00	Content of large stones	0.99
		Depth to hard bedrock	0.29	Content of large stones	0.99	Depth to hard bedrock	0.29
Rock Outcrop	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
430:							
Wilmac, dry	55	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to soft bedrock	0.42	Slope	0.47

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
430:							
Hosta	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
440:							
Losindios	60	Somewhat limited		Not limited		Very limited	
		Shrink-swell	0.50			Slope	1.00
						Shrink-swell	0.50
Jaythree	20	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.01			Shrink-swell	0.01
452:							
Gojiya	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to saturated zone	0.05		
500:							
Escrito	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Dulcepeak	20	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.84	Slope	1.00	Depth to hard bedrock	0.84
501:							
Zau	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Depth to soft bedrock	0.42	Slope	1.00
				Slope	0.04		
Lomapedro	35	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.12

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
515:							
Ustorthents	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
				Depth to soft bedrock	0.64		
Rock Outcrop	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
523:							
Suposo	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.12
Ohwiler	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
524:							
Jicarilla	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.01	Shrink-swell	0.50	Depth to saturated zone	0.01
Ohwiler	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.47
525:							
Jaythree	65	Somewhat limited		Not limited		Very limited	
		Shrink-swell	0.01			Slope	1.00
						Shrink-swell	0.01
Cedarsprings	25	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.12
526:							
Hetz	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.50	Shrink-swell	0.50	Depth to saturated zone	0.50

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
530:							
Wilmac	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to soft bedrock	0.42	Slope	0.12
Hosta	25	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Millpaw	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
531:							
Horselake	50	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
				Depth to soft bedrock	0.06	Slope	1.00
Menefee	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to soft bedrock	1.00
533:							
Badland	90	Not rated		Not rated		Not rated	
540:							
Ishkoten	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to soft bedrock	0.15		
Lajuita	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Depth to hard bedrock	1.00	Depth to soft bedrock	1.00	Depth to hard bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Escrito	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
541:							
Ishkoten	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.01	Depth to soft bedrock	0.64	Shrink-swell	0.01

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
541:							
Lajuita	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
552:							
Haplustalfs	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
Argiustolls	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
553:							
Haplustalfs	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
Ustorthents	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
560:							
Herm	45	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
						Slope	0.86
Dulcepeak	40	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.79	Slope	1.00	Depth to hard bedrock	0.79
571:							
Orlie	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Cementlake	35	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
580:							
Archmesa	60	Somewhat limited		Very limited		Very limited	
		Shrink-swell	0.50	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.16	Shrink-swell	0.50	Shrink-swell	0.50
		Depth to hard bedrock	0.10	Slope	0.16	Depth to hard bedrock	0.10
Skyute	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.16	Slope	0.16	Shrink-swell	0.50
590:							
Abreu Family	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
Rubbleland	15	Not rated		Not rated		Not rated	
Rock Outcrop	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
600:							
Haplustepts	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
				Depth to hard bedrock	0.93		
Haplustalfs	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 12b.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5:							
Water	85	Not rated		Not rated		Not rated	
6:							
Miscellaneous Water	85	Not rated		Not rated		Not rated	
10:							
Elias	45	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Cutbanks cave	0.10	Sodium content	1.00
Canyada	30	Somewhat limited		Very limited		Very limited	
		Flooding	0.40	Cutbanks cave	1.00	Too clayey	1.00
				Too clayey	0.50		
Sparank	20	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Flooding	0.40	Too clayey	0.03		
13:							
Doakum	45	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
Betonnie	45	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
18:							
Sparham	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.60	Too clayey	1.00
		Low strength	1.00	Too clayey	0.12	Flooding	0.60
		Shrink-swell	1.00	Cutbanks cave	0.10		
19:							
Sparham	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		
20:							
Menefee	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	1.00

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
20:							
Vessilla	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Cutbanks cave	0.10	Slope	1.00
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
21:							
Badland	35	Not rated		Not rated		Not rated	
Menefee	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	1.00
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
23:							
Teromote	85	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
24:							
Orlie	45	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Sparham	35	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Too clayey	0.12	Too clayey	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Flooding	0.40				
32:							
Doakum	85	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
40:							
Parkelei	45	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
40:							
Menefee	20	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	1.00
Vessilla	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	0.04	Cutbanks cave	0.10	Depth to bedrock	1.00
				Slope	0.04	Slope	0.04
64:							
Dula	85	Very limited		Very limited		Very limited	
		Frost action	1.00	Cutbanks cave	1.00	Flooding	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
		Low strength	0.22	Flooding	0.80		
		Depth to saturated zone	0.03				
69:							
Pinavetes	50	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.91
Florita	40	Not limited		Somewhat limited		Not limited	
				Cutbanks cave	0.10		
70:							
Blancot	30	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
Councelor	30	Not limited		Very limited		Not limited	
				Cutbanks cave	1.00		
Tsosie	30	Somewhat limited		Somewhat limited		Somewhat limited	
		Low strength	0.78	Cutbanks cave	0.10	Salinity	0.50
		Shrink-swell	0.50				
104:							
Doakum	60	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Low strength	0.22				
Oro	25	Very limited		Very limited		Not limited	
		Low strength	1.00	Cutbanks cave	1.00		
		Shrink-swell	1.00	Too clayey	0.12		

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
105:							
Badland	50	Not rated		Not rated		Not rated	
Menefee	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	1.00
107:							
Berryman	55	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Cutbanks cave	0.10	Carbonate content	1.00
		Shrink-swell	0.50				
		Frost action	0.50				
Ruson	30	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		
108:							
Peney	50	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	0.63	Slope	0.63	Depth to bedrock	1.00
		Frost action	0.50	Cutbanks cave	0.10	Gravel content	0.68
						Slope	0.63
Ransect	35	Very limited		Very limited		Very limited	
		Low strength	1.00	Depth to hard bedrock	1.00	Carbonate content	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Depth to bedrock	0.42
		Frost action	0.50				
		Depth to hard bedrock	0.42				
115:							
Menefee	85	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.98
						Gravel content	0.11
						Content of large stones	0.01
119:							
Roques	45	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Cutbanks cave	0.10		

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
119:							
Nusmag	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Depth to saturated zone	0.24		
				Cutbanks cave	0.10		
136:							
Elpedro	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
155:							
Vessilla	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Cutbanks cave	0.10	Slope	1.00
						Content of large stones	0.01
Menefee	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	1.00
Orlie	20	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
		Low strength	0.22				
156:							
Lindrith	50	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
Royosa	35	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.69
214:							
Quimera	60	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Slope	1.00	Gravel content	1.00
		Low strength	1.00	Too clayey	0.12	Depth to bedrock	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.85

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
214:							
Ishkoten	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of organic matter	1.00
		Low strength	1.00	Depth to soft bedrock	0.90	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Depth to bedrock	0.90
		Frost action	0.50			Droughty	0.35
220:							
Skyvillage	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	0.16	Slope	0.16	Depth to bedrock	1.00
				Cutbanks cave	0.10	Slope	0.16
						Content of large stones	0.01
Eslendo	30	Very limited		Very limited		Very limited	
		Low strength	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	0.16	Droughty	0.87
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.16
		Slope	0.16				
Rock Outcrop	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
229:							
Nusmag	45	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Depth to saturated zone	0.24		
				Cutbanks cave	0.10		
Tottles	35	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.48
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Depth to saturated zone	0.48				
231:							
Sparham	85	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Too clayey	0.28	Salinity	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10	Sodium content	1.00
		Flooding	0.40			Droughty	0.09

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
303:							
Orlie	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
304:							
Orlie	45	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Nalivag	35	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
310:							
Rock Outcrop	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Vessilla	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Slope	1.00	Droughty	1.00
				Cutbanks cave	0.10	Depth to bedrock	1.00
Menefee	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	1.00
						Content of large stones	0.08
340:							
Riverwash	50	Not rated		Not rated		Not rated	
Kwakina	20	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Cutbanks cave	1.00	Droughty	0.69
				Flooding	0.60	Flooding	0.60
				Depth to saturated zone	0.16		
Tapicito	20	Somewhat limited		Very limited		Not limited	
		Flooding	0.40	Cutbanks cave	1.00		
350:							
Hosta	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
370:							
Orlie	85	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
380:							
Teequee	60	Very limited		Somewhat limited		Very limited	
		Low strength	1.00	Too clayey	0.28	Content of large stones	1.00
		Shrink-swell	1.00	Slope	0.16	Slope	0.16
		Slope	0.16	Cutbanks cave	0.10		
Menefee	15	Somewhat limited		Very limited		Very limited	
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Slope	0.84	Slope	0.84	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	0.84
Vessilla	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Droughty	1.00
		Slope	0.84	Slope	0.84	Depth to bedrock	1.00
				Cutbanks cave	0.10	Slope	0.84
						Content of large stones	0.01
390:							
Losindios	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Content of organic matter	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	1.00
		Frost action	0.50				
Escrito	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Droughty	0.94
				Cutbanks cave	0.10	Content of large stones	0.20
						Slope	0.16
Parkelei	25	Somewhat limited		Somewhat limited		Not limited	
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
403:							
Vosburg	55	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
403:							
Millpaw	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
421:							
Argiustolls	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Content of large stones	1.00	Content of large stones	1.00
		Content of large stones	1.00	Cutbanks cave	0.10	Droughty	0.48
		Shrink-swell	0.50				
		Frost action	0.50				
Ustorthents	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	0.99	Depth to hard bedrock	1.00	Content of large stones	1.00
		Frost action	0.50	Content of large stones	0.99	Droughty	0.87
		Depth to hard bedrock	0.29	Cutbanks cave	0.10	Depth to bedrock	0.29
Rock Outcrop	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
430:							
Wilmac, dry	55	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.42	Depth to bedrock	0.42
		Shrink-swell	1.00	Cutbanks cave	0.10	Content of large stones	0.01
		Frost action	0.50				
Hosta	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50	Too clayey	0.04		
		Frost action	0.50				
440:							
Losindios	60	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Content of organic matter	1.00
		Frost action	0.50				
Jaythree	20	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Cutbanks cave	0.10	Content of organic matter	1.00
		Shrink-swell	0.01				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
452:							
Gojiya	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Low strength	1.00	Too clayey	1.00	Too clayey	1.00
		Shrink-swell	1.00	Cutbanks cave	0.10		
				Depth to saturated zone	0.05		
500:							
Escrito	45	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Content of organic matter	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
				Cutbanks cave	0.10	Slope	1.00
						Droughty	0.96
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Dulcepeak	20	Very limited		Very limited		Very limited	
		Low strength	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Shrink-swell	1.00	Slope	1.00	Depth to bedrock	0.84
		Slope	1.00	Too clayey	0.12	Droughty	0.05
		Depth to hard bedrock	0.84	Cutbanks cave	0.10		
501:							
Zau	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Depth to soft bedrock	0.42	Depth to bedrock	0.42
		Slope	0.04	Too clayey	0.12	Droughty	0.14
				Cutbanks cave	0.10	Slope	0.04
				Slope	0.04		
Lomapedro	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
515:							
Ustorthents	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Droughty	1.00
		Frost action	0.50	Depth to soft bedrock	0.64	Content of large stones	1.00
				Cutbanks cave	0.10	Depth to bedrock	0.65

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
515:							
Rock Outcrop	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
523:							
Suposo	45	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.28		
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Frost action	0.50				
Ohwiler	40	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
524:							
Jicarilla	50	Very limited		Very limited		Not limited	
		Frost action	1.00	Depth to saturated zone	1.00		
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
		Flooding	0.40				
Ohwiler	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
525:							
Jaythree	65	Somewhat limited		Somewhat limited		Very limited	
		Frost action	0.50	Cutbanks cave	0.10	Content of organic matter	1.00
		Shrink-swell	0.01				
Cedarsprings	25	Very limited		Somewhat limited		Very limited	
		Shrink-swell	1.00	Cutbanks cave	0.10	Content of organic matter	1.00
		Low strength	1.00	Too clayey	0.03		
526:							
Hetz	85	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.22
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Depth to saturated zone	0.22				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
530:							
Wilmac	45	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Depth to soft bedrock	0.42	Depth to bedrock	0.42
		Shrink-swell	1.00	Cutbanks cave	0.10	Content of large stones	0.01
		Frost action	0.50				
Hosta	25	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Millpaw	35	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
531:							
Horselake	50	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.68	Depth to bedrock	0.06
		Shrink-swell	1.00	Cutbanks cave	0.10		
				Depth to soft bedrock	0.06		
Menefee	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Frost action	0.50	Cutbanks cave	0.10	Slope	1.00
533:							
Badland	90	Not rated		Not rated		Not rated	
540:							
Ishkoten	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Depth to soft bedrock	0.15	Content of organic matter	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Depth to bedrock	0.16
Lajuita	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Slope	1.00	Content of organic matter	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	1.00
		Frost action	0.50				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
540:							
Escrito	20	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Slope	1.00	Content of organic matter	1.00
				Cutbanks cave	0.10	Depth to bedrock	1.00
						Droughty	0.93
541:							
Ishkoten	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.01	Depth to soft bedrock	0.64	Content of organic matter	1.00
				Cutbanks cave	0.10	Depth to bedrock	0.65
						Droughty	0.01
Lajuita	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Slope	1.00	Content of organic matter	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	1.00
		Frost action	0.50			Depth to bedrock	1.00
552:							
Haplustalfs	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of organic matter	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.43
Argiustolls	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of organic matter	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.11
553:							
Haplustalfs	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of organic matter	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.81
Ustorthents	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Droughty	1.00
		Frost action	0.50	Cutbanks cave	0.10	Depth to bedrock	1.00

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
560:							
Herm	45	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Cutbanks cave	0.10		
Dulcepeak	40	Very limited		Very limited		Very limited	
		Low strength	1.00	Cutbanks cave	1.00	Content of large stones	1.00
		Shrink-swell	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	0.80
		Depth to hard bedrock	0.79	Too clayey	0.12	Droughty	0.06
571:							
Orlie	50	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Cementlake	35	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Cutbanks cave	0.10	Sodium content	1.00
		Frost action	0.50	Too clayey	0.03		
580:							
Archmesa	60	Somewhat limited		Very limited		Somewhat limited	
		Low strength	0.78	Depth to hard bedrock	1.00	Slope	0.16
		Shrink-swell	0.50	Slope	0.16	Depth to bedrock	0.10
		Frost action	0.50	Cutbanks cave	0.10	Content of large stones	0.08
		Slope	0.16				
		Depth to hard bedrock	0.10				
Skyute	25	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Low strength	0.78	Slope	0.16	Droughty	0.53
		Shrink-swell	0.50	Cutbanks cave	0.10	Slope	0.16
		Frost action	0.50			Content of large stones	0.08
		Slope	0.16				
590:							
Abreu Family	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of large stones	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Frost action	0.50	Cutbanks cave	0.10	Droughty	0.01

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
590:							
Rubbleland	15	Not rated		Not rated		Not rated	
Rock Outcrop	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
600:							
Haplustepts	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00	Content of organic matter	1.00
		Frost action	0.50	Depth to hard bedrock	0.93		
				Cutbanks cave	0.10		
Haplustalfs	35	Very limited		Very limited		Very limited	
		Content of large stones	1.00	Content of large stones	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Content of organic matter	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10	Droughty	0.36
		Frost action	0.50				

Table 13a.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5:					
Water	85	Not rated		Not rated	
6:					
Miscellaneous Water	85	Not rated		Not rated	
10:					
Elias	45	Somewhat limited		Very limited	
		Flooding	0.40	Seepage	1.00
				Flooding	0.40
				Slope	0.01
Canyada	30	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
				Slope	0.01
Sparank	20	Very limited		Somewhat limited	
		Restricted permeability	1.00	Flooding	0.40
		Flooding	0.40		
13:					
Doakum	45	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.67
Betonnie	45	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.01
18:					
Sparham	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Slope	0.01
19:					
Sparham	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Slope	0.01

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
20:					
Menefee	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Vessilla	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.19
Rock Outcrop	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
21:					
Badland	35	Not rated		Not rated	
Menefee	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Rock Outcrop	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
23:					
Teromote	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.01
24:					
Orlie	45	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.09
Sparham	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Flooding	0.40
		Flooding	0.40		
32:					
Doakum	85	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.09

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
40:					
Parkelei	45	Somewhat limited		Very limited	
		Restricted permeability	0.46	Seepage	1.00
				Slope	0.91
Menefee	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Vessilla	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.04	Seepage	1.00
				Slope	1.00
64:					
Dula	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.46		
69:					
Pinavetes	50	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.91
Florita	40	Not limited		Very limited	
				Seepage	1.00
				Slope	0.09
70:					
Blancot	30	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.09
Councelor	30	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Restricted permeability	0.47	Slope	0.33
Tsosie	30	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.53
				Slope	0.01

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
104:					
Doakum	60	Very limited Restricted permeability	1.00	Very limited Seepage	1.00
				Slope	0.09
Oro	25	Very limited Restricted permeability	1.00	Very limited Seepage	1.00
		Filtering capacity	1.00	Slope	0.01
105:					
Badland	50	Not rated		Not rated	
Menefee	30	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
107:					
Berryman	55	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
Ruson	30	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.01
108:					
Peney	50	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
		Slope	0.63	Slope	1.00
Ransect	35	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock	1.00
				Slope	0.33
115:					
Menefee	85	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
119:					
Roques	45	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.67

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
119:					
Nusmag	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.02
		Depth to saturated zone	0.65	Slope	0.01
136:					
Elpedro	85	Somewhat limited		Somewhat limited	
		Restricted permeability	0.46	Seepage	0.53
				Slope	0.09
155:					
Vessilla	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Seepage	1.00
				Slope	1.00
Menefee	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
Orlie	20	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
156:					
Lindrith	50	Very limited		Somewhat limited	
		Filtering capacity	1.00	Slope	0.67
		Restricted permeability	0.46	Seepage	0.53
Royosa	35	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	0.67
214:					
Quimera	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
Ishkoten	25	Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00		

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
220:					
Skyvillage	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Seepage	1.00
				Slope	1.00
Eslendo	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.16	Slope	1.00
Rock Outcrop	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
229:					
Nusmag	45	Very limited		Somewhat limited	
		Restricted permeability	1.00	Depth to saturated zone	0.02
		Depth to saturated zone	0.65	Slope	0.01
Tottles	35	Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
231:					
Sparham	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Flooding	0.40
		Flooding	0.40	Slope	0.01
303:					
Orlie	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.33
304:					
Orlie	45	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
Nalivag	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.25
				Slope	0.09

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
310:					
Rock Outcrop	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
Vessilla	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
Menefee	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
340:					
Riverwash	50	Not rated		Not rated	
Kwakina	20	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
		Depth to saturated zone	0.43		
Tapicito	20	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Flooding	0.40	Flooding	0.40
350:					
Hosta	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.53
				Slope	0.09
370:					
Orlie	85	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
380:					
Teequee	60	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.16		
Menefee	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.84	Slope	1.00

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
380:					
Vessilla	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.84	Slope	1.00
				Seepage	0.01
390:					
Losindios	35	Very limited		Very limited	
		Slope	1.00	Seepage	1.00
		Restricted permeability	1.00	Slope	1.00
Escrito	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Seepage	1.00
				Slope	1.00
Parkelei	25	Somewhat limited		Very limited	
		Restricted permeability	0.46	Seepage	1.00
				Slope	0.91
403:					
Vosburg	55	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.91
Millpaw	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.33
421:					
Argiustolls	45	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00	Content of large stones	1.00
		Content of large stones	1.00	Seepage	0.68
Ustorthents	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Content of large stones	0.99	Seepage	1.00
				Content of large stones	1.00

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
421:					
Rock Outcrop	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
430:					
Wilmac, dry	55	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.91
Hosta	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.33
440:					
Losindios	60	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	1.00
Jaythree	20	Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00
				Slope	0.09
452:					
Gojiya	85	Very limited		Very limited	
		Restricted permeability	1.00	Ponding	1.00
		Ponding	1.00	Slope	0.09
		Depth to saturated zone	0.12		
500:					
Escrito	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Seepage	1.00
				Slope	1.00
Rock Outcrop	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
Dulcepeak	20	Very limited		Very limited	
		Restricted permeability	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Seepage	0.01

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
501:					
Zau	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	0.04	Slope	1.00
				Seepage	0.53
Lomapedro	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
		Depth to bedrock	0.52	Seepage	0.53
				Depth to soft bedrock	0.08
515:					
Ustorthents	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Content of large stones	1.00	Content of large stones	1.00
				Seepage	1.00
Rock Outcrop	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
523:					
Suposo	45	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
Ohwiler	40	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
				Seepage	0.53
524:					
Jicarilla	50	Very limited		Very limited	
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	0.40
		Flooding	0.40	Slope	0.33
				Seepage	0.01
Ohwiler	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.91
				Seepage	0.53

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
525:					
Jaythree	65	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	1.00
Cedarsprings	25	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.67
				Seepage	0.01
526:					
Hetz	85	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00		
530:					
Wilmac	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
				Slope	0.67
Hosta	25	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.09
Millpaw	15	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.01
531:					
Horselake	50	Very limited		Very limited	
		Restricted permeability	1.00	Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
Menefee	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
533:					
Badland	90	Not rated		Not rated	
540:					
Ishkoten	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00	Content of large stones	0.20

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
540:					
Lajuita	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Depth to soft bedrock	1.00
				Slope	1.00
				Seepage	0.01
Escrito	20	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	1.00
541:					
Ishkoten	55	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Restricted permeability	1.00		
Lajuita	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
552:					
Haplustalfs	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00
		Restricted permeability	1.00	Seepage	0.01
Argiustolls	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00
		Restricted permeability	0.72	Seepage	1.00
553:					
Haplustalfs	55	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00
				Seepage	1.00

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
553:					
Ustorthents	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Content of large stones	1.00	Content of large stones	0.81
560:					
Herm	45	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
Dulcepeak	40	Very limited		Very limited	
		Restricted permeability	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Seepage	0.01
571:					
Orlie	50	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.33
Cementlake	35	Very limited		Somewhat limited	
		Restricted permeability	1.00	Slope	0.33
580:					
Archmesa	60	Very limited		Very limited	
		Restricted permeability	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Slope	0.16		
Skyute	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	0.16	Slope	1.00
590:					
Abreu Family	65	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00
		Restricted permeability	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Seepage	0.68
Rubbleland	15	Not rated		Not rated	

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
590:					
Rock Outcrop	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.01
600:					
Haplustepts	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Seepage	1.00
		Depth to bedrock	0.98	Content of large stones	1.00
				Depth to hard bedrock	0.93
Haplustalfs	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Content of large stones	1.00	Content of large stones	1.00
		Restricted permeability	0.47	Seepage	0.53

Table 13b.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5:							
Water	85	Not rated		Not rated		Not rated	
6:							
Miscellaneous Water	85	Not rated		Not rated		Not rated	
10:							
Elias	45	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.22
Canyada	30	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too Sandy	1.00
		Too Sandy	1.00			Seepage	1.00
Sparank	20	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
13:							
Doakum	45	Not limited		Not limited		Somewhat limited	
						Seepage	0.01
Betonnie	45	Not limited		Not limited		Somewhat limited	
						Seepage	0.52
18:							
Sparham	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Hard to compact	1.00
19:							
Sparham	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Hard to compact	1.00
20:							
Menefee	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Vessilla	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
21:							
Badland	35	Not rated		Not rated		Not rated	
Menefee	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
23:							
Teromote	85	Somewhat limited		Somewhat limited		Not limited	
		Flooding	0.40	Flooding	0.40		
24:							
Orlie	45	Not limited		Not limited		Not limited	
Sparham	35	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Hard to compact	1.00
32:							
Doakum	85	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.01
40:							
Parkelei	45	Not limited		Not limited		Somewhat limited	
						Seepage	0.52
Menefee	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Vessilla	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.04	Slope	0.04	Seepage	0.52
						Slope	0.04
64:							
Dula	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too Sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.68
		Too Sandy	1.00			Gravel content	0.04
69:							
Pinavetes	50	Very limited		Not limited		Very limited	
		Too Sandy	1.00			Too Sandy	1.00
						Seepage	1.00
Florita	40	Not limited		Not limited		Somewhat limited	
						Seepage	0.52

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70:							
Blancot	30	Not limited		Not limited		Not limited	
Councelor	30	Very limited		Not limited		Very limited	
		Too Sandy	1.00			Seepage	1.00
						Too Sandy	0.50
Tsosie	30	Not limited		Not limited		Not limited	
104:							
Doakum	60	Not limited		Not limited		Not limited	
Oro	25	Very limited		Not limited		Very limited	
		Too Sandy	1.00			Seepage	1.00
						Too Sandy	0.50
105:							
Badland	50	Not rated		Not rated		Not rated	
Menefee	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
107:							
Berryman	55	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Carbonate content	1.00
						Too clayey	0.50
Ruson	30	Not limited		Not limited		Very limited	
						Hard to compact	1.00
108:							
Peney	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
Ransect	35	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	0.50			Carbonate content	1.00
						Too clayey	0.50
115:							
Menefee	85	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
119:							
Roques	45	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
119:							
Nusmag	35	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Depth to saturated zone	1.00			Hard to compact	1.00
136:							
Elpedro	85	Not limited		Not limited		Not limited	
155:							
Vessilla	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
						Seepage	0.52
Menefee	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
Orlie	20	Not limited		Not limited		Not limited	
156:							
Lindrith	50	Not limited		Not limited		Not limited	
Royosa	35	Very limited		Not limited		Very limited	
		Too Sandy	1.00			Seepage	1.00
						Too Sandy	0.50
214:							
Quimera	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Ishkoten	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
220:							
Skyvillage	30	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.16	Depth to bedrock	1.00
		Slope	0.16			Seepage	0.52
						Slope	0.16
Eslendo	30	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.16	Depth to bedrock	1.00
		Slope	0.16			Slope	0.16

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
220:							
Rock Outcrop--------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
229:							
Nusmag----------	45	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Depth to saturated zone	1.00			Hard to compact	1.00
Tottles----------	35	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
						Depth to saturated zone	0.96
231:							
Sparham----------	85	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Hard to compact	1.00
303:							
Orlie----------	85	Not limited		Not limited		Not limited	
304:							
Orlie----------	45	Not limited		Not limited		Not limited	
Nalivag----------	35	Not limited		Not limited		Not limited	
310:							
Rock Outcrop--------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Vessilla----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Seepage	0.52
Menefee----------	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00			Slope	1.00
340:							
Riverwash----------	50	Not rated		Not rated		Not rated	
Kwakina----------	20	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Too Sandy	1.00			Too Sandy	0.50

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
340:							
Tapicito	20	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Seepage	1.00
350:							
Hosta	85	Not limited		Not limited		Not limited	
370:							
Orlie	85	Not limited		Not limited		Not limited	
380:							
Teequee	60	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.16	Too clayey	1.00
		Slope	0.16			Hard to compact	1.00
						Slope	0.16
Menefee	15	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Slope	0.84	Depth to bedrock	1.00
		Slope	0.84			Slope	0.84
Vessilla	15	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.84	Slope	0.84	Slope	0.84
390:							
Losindios	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Seepage	0.01
Escrito	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	0.16	Seepage	0.52
		Slope	0.16			Slope	0.16
Parkelei	25	Not limited		Not limited		Somewhat limited	
						Seepage	0.52
403:							
Vosburg	55	Not limited		Not limited		Not limited	
Millpaw	35	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
421:							
Argiustolls	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Depth to bedrock	1.00	Content of large stones	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
421:							
Ustorthents	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Seepage	1.00	Content of large stones	0.99
		Content of large stones	0.99			Seepage	0.01
Rock Outcrop	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
430:							
Wilmac, dry	55	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
Hosta	35	Very limited		Not limited		Not limited	
		Salinity	1.00				
440:							
Losindios	60	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.01
Jaythree	20	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.01
452:							
Gojiya	85	Very limited		Very limited		Very limited	
		Too clayey	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Depth to saturated zone	1.00			Hard to compact	1.00
500:							
Escrito	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage	1.00	Slope	1.00	Slope	1.00
		Slope	1.00			Seepage	0.21
Rock Outcrop	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Dulcepeak	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	1.00	Too clayey	1.00
		Slope	1.00			Slope	1.00
501:							
Zau	55	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.04	Slope	0.04	Hard to compact	1.00
						Slope	0.04

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
501:							
Lomapedro	35	Very limited		Somewhat limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	0.08	Hard to compact	1.00
		Too clayey	0.50			Too clayey	0.50
						Depth to bedrock	0.08
515:							
Ustorthents	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Content of large stones	1.00	Seepage	1.00	Content of large stones	1.00
		Seepage	1.00			Seepage	0.01
Rock Outcrop	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
523:							
Suposo	45	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Ohwiler	40	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
524:							
Jicarilla	50	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.50
		Flooding	0.40	Flooding	0.40		
Ohwiler	35	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
525:							
Jaythree	65	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Seepage	1.00	Seepage	0.01
Cedarsprings	25	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
526:							
Hetz	85	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.87
		Too clayey	0.50			Too clayey	0.50
530:							
Wilmac	45	Very limited		Not limited		Very limited	
		Depth to bedrock	1.00			Depth to bedrock	1.00
Hosta	25	Not limited		Not limited		Not limited	

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
530:							
Millpaw	15	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
531:							
Horselake	50	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
Menefee	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Slope	1.00	Depth to bedrock	1.00
		Slope	1.00			Slope	1.00
533:							
Badland	90	Not rated		Not rated		Not rated	
540:							
Ishkoten	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
Lajuita	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
Escrito	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Seepage	1.00			Seepage	0.52
541:							
Ishkoten	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
Lajuita	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
						Too acid	1.00
						Seepage	1.00
552:							
Haplustalfs	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00			Content of large stones	1.00
		Seepage	1.00				

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
552:							
Argiustolls	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00			Content of large stones	1.00
		Content of large stones	1.00			Seepage	0.51
553:							
Haplustalfs	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage	1.00	Seepage	1.00	Content of large stones	1.00
		Content of large stones	1.00			Seepage	0.14
Ustorthents	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Content of large stones	1.00			Content of large stones	1.00
		Seepage	1.00			Seepage	0.01
560:							
Herm	45	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Dulcepeak	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Too clayey	1.00	Slope	1.00	Too clayey	1.00
		Slope	1.00			Hard to compact	1.00
						Slope	1.00
571:							
Orlie	50	Not limited		Not limited		Not limited	
Cementlake	35	Not limited		Not limited		Not limited	
580:							
Archmesa	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	0.16
Skyute	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	0.16	Slope	0.16	Slope	0.16
590:							
Abreu Family	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00	Depth to bedrock	1.00	Content of large stones	1.00
		Depth to bedrock	1.00			Depth to bedrock	1.00
		Too clayey	0.50			Too clayey	0.50

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
590:							
Rubbleland----------	15	Not rated		Not rated		Not rated	
Rock Outcrop--------	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
600:							
Haplustepts---------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Content of large stones	1.00
		Seepage	1.00	Depth to bedrock	0.93	Depth to bedrock	0.93
		Content of large stones	1.00			Seepage	0.22
Haplustalfs---------	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Content of large stones	1.00			Content of large stones	1.00

Table 14a.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5:							
Water	85	Not rated		Not rated		Not rated	
6:							
Miscellaneous Water	85	Not rated		Not rated		Not rated	
10:							
Elias	45	Improbable Gravel Source		Probable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00	Salinity	0.00
		Thickest layer not a source	0.00	Bottom layer	0.01	Sodium content	0.00
Canyada	30	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.01	Sodium content	0.60
		Thickest layer not a source	0.00	Bottom layer	0.22		
Sparank	20	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00	Too Clayey	0.63
		Thickest layer not a source	0.00	Bottom layer	0.03	Sodium content	0.98
13:							
Betonnie	45	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.07		
Doakum	45	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer	0.01	Sodium content	0.70
		Thickest layer not a source	0.00	Thickest layer	0.03		

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
18:							
Sparham	85	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Sodium content	0.60
						Rock fragment content	0.97
19:							
Sparham	85	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Sodium content	0.60
						Rock fragment content	0.97
20:							
Menefee	35	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
Vessilla	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
Rock Outcrop	20	Not rated		Not rated		Not rated	
21:							
Badland	35	Not rated		Not rated		Not rated	
Menefee	35	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.00
Rock Outcrop	20	Not rated		Not rated		Not rated	

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
23:							
Teromote	85	Improbable Gravel Source		Improbable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00		
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
24:							
Orlie	45	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Rock fragment content	0.97
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Sparham	35	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Sodium content	0.60
						Rock fragment content	0.97
32:							
Doakum	85	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer	0.01	Sodium content	0.70
		Thickest layer not a source	0.00	Thickest layer	0.03		
40:							
Parkelei	45	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.06		
Menefee	20	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
Vessilla	20	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.96

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
64:							
Dula	85	Probable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Thickest layer not a source	0.00	Bottom layer not a source	0.00	Hard to reclaim	0.00
		Bottom layer	0.20	Thickest layer not a source	0.00	Depth to saturated zone	0.76
69:							
Pinavetes	50	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.16	Too sandy	0.06
		Thickest layer not a source	0.00	Bottom layer	0.33		
Florita	40	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer	0.01		
		Thickest layer not a source	0.00	Thickest layer	0.01		
70:							
Blancot	30	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Sodium content	0.90
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Councelor	30	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer	0.04		
		Thickest layer not a source	0.00	Thickest layer	0.04		
Tsosie	30	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Salinity	0.50
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Sodium content	0.60
						Rock fragment content	0.97

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
104:							
Doakum	60	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00	Sodium content	0.60
		Thickest layer not a source	0.00	Bottom layer	0.00		
Oro	25	Improbable Gravel Source		Probable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Bottom layer	0.07		
105:							
Badland	50	Not rated		Not rated		Not rated	
Menefee	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.00
107:							
Berryman	55	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Carbonate content	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Ruson	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Rock fragment content	0.97
108:							
Peney	50	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.37
						Carbonate content	0.92
						Rock fragment content	0.97

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
108:							
Ransect	35	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Carbonate content	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.58
115:							
Menefee	80	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
119:							
Roques	45	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Nusmag	35	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
136:							
Elpedro	85	Improbable Gravel Source		Improbable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00		
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
155:							
Vessilla	45	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
Menefee	25	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
155:							
Orlie	20	Improbable Gravel Source		Improbable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00		
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
156:							
Lindrith	50	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.04		
		Thickest layer not a source	0.00	Bottom layer	0.16		
Royosa	35	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.16	Too sandy	0.06
		Thickest layer not a source	0.00	Bottom layer	0.33		
214:							
Quimera	60	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
						Too Clayey	0.51
Ishkoten	25	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
						Rock fragment content	0.28
						Too Clayey	0.33
220:							
Skyvillage	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.84

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
220:							
Eslendo	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.84
Rock Outcrop	30	Not rated		Not rated		Not rated	
229:							
Nusmag	45	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Tottles	35	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to saturated zone	0.29
231:							
Sparham	85	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Salinity	0.00
						Sodium content	0.00
						Rock fragment content	0.97
303:							
Orlie	85	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Rock fragment content	0.97
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
304:							
Orlie	45	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Rock fragment content	0.97
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
304:							
Nalivag	35	Improbable Gravel Source		Improbable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00		
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
310:							
Rock Outcrop	40	Not rated		Not rated		Not rated	
Vessilla	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.00
Menefee	20	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.00
						Too sandy	0.00
340:							
Riverwash	50	Not rated		Not rated		Not rated	
Kwakina	20	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer	0.11	Too sandy	0.94
		Thickest layer not a source	0.00	Thickest layer	0.16		
Tapicito	20	Improbable Gravel Source		Probable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00	Depth to saturated zone	0.00
		Thickest layer not a source	0.00	Bottom layer	0.09	Salinity	0.88
						Sodium content	0.98
350:							
Hosta	85	Improbable Gravel Source		Improbable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00		
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
370:							
Orlie	85	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Rock fragment content	0.97
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
380:							
Teequee	60	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.84
Menefee	15	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.16
Vessilla	15	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.16
390:							
Losindios	35	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.01		
Escrito	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.84
						Rock fragment content	0.96
Parkelei	25	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.06		

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
403:							
Vosburg	55	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.03		
Millpaw	35	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.47
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
421:							
Argiustolls	45	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Thickest layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Bottom layer not a source	0.00	Thickest layer not a source	0.00	Rock fragment content	0.00
						Depth to bedrock	0.00
Ustorthents	35	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Rock fragment content	0.00
						Depth to bedrock	0.00
Rock Outcrop	15	Not rated		Not rated		Not rated	
430:							
Wilmac, dry	55	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.28
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.58
Hosta	35	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Salinity	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
440:							
Losindios	60	Improbable Gravel Source		Probable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.00	Slope	0.84
		Thickest layer not a source	0.00	Bottom layer	0.01		
Jaythree	20	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.04		
452:							
Gojiya	85	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Sodium content	0.98
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
500:							
Escrito	45	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Rock Outcrop	20	Not rated		Not rated		Not rated	
Dulcepeak	20	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.21
501:							
Zau	55	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.58
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.96

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
501:							
Lomapedro	35	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Hard to reclaim	0.96
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
515:							
Ustorthents	60	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Thickest layer not a source	0.00	Bottom layer not a source	0.00	Rock fragment content	0.00
		Bottom layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.00
Rock Outcrop	30	Not rated		Not rated		Not rated	
523:							
Suposo	45	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Ohwiler	40	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.01		
524:							
Jicarilla	50	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.49
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to saturated zone	0.88
Ohwiler	35	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer not a source	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.01		

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
525:							
Jaythree	65	Improbable Gravel Source		Probable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Thickest layer	0.00		
		Thickest layer not a source	0.00	Bottom layer	0.04		
Cedarsprings	25	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.12
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
526:							
Hetz	85	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to saturated zone	0.50
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
530:							
Wilmac	45	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.28
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.58
Hosta	25	Improbable Gravel Source		Improbable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00		
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Millpaw	15	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.47
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
531:							
Horselake	50	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
531:							
Menefee	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
533:							
Badland	90	Not rated		Not rated		Not rated	
540:							
Ishkoten	45	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
						Rock fragment content	0.28
						Too Clayey	0.33
Lajuita	25	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too sandy	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.00
						Depth to bedrock	0.00
Escrito	20	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
541:							
Ishkoten	55	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
						Rock fragment content	0.28
						Too Clayey	0.33

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
541:							
Lajuita	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Depth to bedrock	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Slope	0.00
						Rock fragment content	0.28
552:							
Haplustalfs	40	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Rock fragment content	0.00
						Hard to reclaim	0.50
Argiustolls	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Hard to reclaim	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Rock fragment content	0.00
						Slope	0.00
553:							
Haplustalfs	55	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Hard to reclaim	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Rock fragment content	0.00
						Slope	0.00
Ustorthents	30	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Too sandy	0.00
560:							
Herm	45	Improbable Gravel Source		Improbable Sand Source		Good Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00		
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		

Table 14a.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of gravel		Potential source of sand		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
560:							
Dulcepeak	40	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.21
571:							
Orlie	50	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Rock fragment content	0.97
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
Cementlake	35	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too Clayey	0.08
		Thickest layer not a source	0.00	Thickest layer not a source	0.00		
580:							
Archmesa	60	Improbable Gravel Source		Improbable Sand Source		Fair Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.84
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Rock fragment content	0.88
Skyute	25	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Too sandy	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Depth to bedrock	0.00
						Slope	0.84
590:							
Abreu Family	65	Improbable Gravel Source		Improbable Sand Source		Poor Source of Topsoil	
		Bottom layer not a source	0.00	Bottom layer not a source	0.00	Slope	0.00
		Thickest layer not a source	0.00	Thickest layer not a source	0.00	Hard to reclaim	0.00
						Rock fragment content	0.00
Rubbleland	15	Not rated		Not rated		Not rated	

Table 14b.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5:					
Water	85	Not rated		Not rated	
6:					
Miscellaneous Water	85	Not rated		Not rated	
10:					
Elias	45	Poor Reclamation Area		Good Source for Roadfill	
		Sodium content	0.00		
		Too alkaline	0.00		
		Low content of organic matter	0.12		
		Salinity	0.88		
		No water erosion limitation	0.99		
Canyada	30	Poor Reclamation Area		Good Source for Roadfill	
		Too alkaline	0.00		
		Low content of organic matter	0.12		
		Sodium content	0.60		
Sparank	20	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.88	Shrink-swell	0.61
		Too clayey	0.88		
		Sodium content	0.97		
13:					
Betonnie	45	Fair Reclamation Area		Good Source for Roadfill	
		Low content of organic matter	0.08		
Doakum	45	Fair Reclamation Area		Good Source for Roadfill	
		Low content of organic matter	0.12		
		Sodium content	0.70		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
18:					
Sparham	85	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.08	Shrink-swell	0.12
		Sodium content	0.60		
19:					
Sparham	85	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.08	Shrink-swell	0.12
		Sodium content	0.60		
		Water erosion	0.90		
20:					
Menefee	35	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.50		
Vessilla	30	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.88		
Rock Outcrop	20	Not rated		Not rated	
21:					
Badland	35	Not rated		Not rated	
Menefee	35	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.50		
Rock Outcrop	20	Not rated		Not rated	
23:					
Teromote	85	Fair Reclamation Area		Good Source for Roadfill	
		Low content of organic matter	0.82		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
24:					
Orlie	45	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.08	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.87
Sparham	35	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.08	Shrink-swell	0.12
		Sodium content	0.60		
32:					
Doakum	85	Fair Reclamation Area		Good Source for Roadfill	
		Low content of organic matter	0.12		
		Sodium content	0.70		
40:					
Parkelei	45	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.99
Menefee	20	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.50		
Vessilla	20	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.88		
64:					
Dula	85	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.88	Depth to saturated zone	0.76
		Droughty	0.98		
		No water erosion limitation	0.99		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
69:					
Pinavetes	50	Poor Reclamation Area		Good Source for Roadfill	
		Wind erosion	0.00		
		Too sandy	0.06		
		Low content of organic matter	0.32		
		Droughty	0.40		
Florita	40	Fair Reclamation Area		Good Source for Roadfill	
		Low content of organic matter	0.88		
70:					
Blancot	30	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.18	Shrink-swell	0.87
		Sodium content	0.90		
		No water erosion limitation	0.99		
Councelor	30	Fair Reclamation Area		Good Source for Roadfill	
		Low content of organic matter	0.08		
Tsosie	30	Poor Reclamation Area		Fair Source for Roadfill	
		Too alkaline	0.00	Shrink-swell	0.87
		Low content of organic matter	0.08		
		Sodium content	0.60		
		No water erosion limitation	0.99		
104:					
Doakum	60	Fair Reclamation Area		Fair Source for Roadfill	
		Sodium content	0.60	Low strength	0.78
		Low content of organic matter	0.88		
Oro	25	Poor Reclamation Area		Fair Source for Roadfill	
		Too clayey	0.00	Shrink-swell	0.99
		Low content of organic matter	0.05		
105:					
Badland	50	Not rated		Not rated	

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
105:					
Menefee	30	Poor Reclamation Area		Poor Source for Roadfill	
		Depth to bedrock	0.00	Slope	0.00
		Droughty	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.50		
		No water erosion limitation	0.99		
107:					
Berryman	55	Poor Reclamation Area		Poor Source for Roadfill	
		Carbonate content	0.00	Low strength	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87
		Water erosion	0.90		
Ruson	30	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.12	Shrink-swell	0.23
		Water erosion	0.90		
108:					
Peney	50	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.50		
		Water erosion	0.90		
		Carbonate content	0.92		
Ransect	35	Poor Reclamation Area		Poor Source for Roadfill	
		Carbonate content	0.00	Low strength	0.00
		Low content of organic matter	0.32	Depth to bedrock	0.00
		Depth to bedrock	0.58	Shrink-swell	0.87
		No water erosion limitation	0.99		
115:					
Menefee	80	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.68
		Low content of organic matter	0.50		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
119:					
Roques	45	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.12	Shrink-swell	0.12
Nusmag	35	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.88	Shrink-swell	0.12
136:					
Elpedro	85	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.12	Low strength	0.00
		Water erosion	0.90		
155:					
Vessilla	45	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.98
		Low content of organic matter	0.12		
Menefee	25	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.98
		Low content of organic matter	0.50		
Orlie	20	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.87
156:					
Lindrith	50	Poor Reclamation Area		Good Source for Roadfill	
		Too alkaline	0.00		
		Low content of organic matter	0.12		
		No water erosion limitation	0.99		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
156:					
Royosa	35	Poor Reclamation Area		Good Source for Roadfill	
		Wind erosion	0.00		
		Too sandy	0.06		
		Droughty	0.80		
214:					
Quimera	60	Poor Reclamation Area		Poor Source for Roadfill	
		Depth to bedrock	0.00	Slope	0.00
		Droughty	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.12	Low strength	0.00
		Too clayey	0.88	Shrink-swell	0.87
Ishkoten	25	Poor Reclamation Area		Poor Source for Roadfill	
		Depth to bedrock	0.00	Low strength	0.00
		Droughty	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.50	Slope	0.08
		Too clayey	0.50	Shrink-swell	0.87
220:					
Skyvillage	30	Poor Reclamation Area		Poor Source for Roadfill	
		Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00		
Eslendo	30	Poor Reclamation Area		Poor Source for Roadfill	
		Depth to bedrock	0.00	Low strength	0.00
		Droughty	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.12	Shrink-swell	0.87
		No water erosion limitation	0.99		
Rock Outcrop	30	Not rated		Not rated	
229:					
Nusmag	45	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.32	Shrink-swell	0.12

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
229:					
Tottles	35	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.92	Shrink-swell	0.26
				Depth to saturated zone	0.29
231:					
Sparham	85	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Sodium content	0.00	Shrink-swell	0.12
		Low content of organic matter	0.12		
		Salinity	0.50		
303:					
Orlie	85	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.08	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.87
304:					
Orlie	45	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.12	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.87
Nalivag	35	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.50	Shrink-swell	0.87
		No water erosion limitation	0.99		
310:					
Rock Outcrop	40	Not rated		Not rated	
Vessilla	30	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.50
		Low content of organic matter	0.88		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
310:					
Menefee	20	Poor Reclamation Area		Poor Source for Roadfill	
		Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00	Slope	0.50
		Too sandy	0.00		
		Low content of organic matter	0.00		
		No water erosion limitation	0.99		
340:					
Riverwash	50	Not rated		Not rated	
Kwakina	20	Poor Reclamation Area		Good Source for Roadfill	
		Wind erosion	0.00		
		Low content of organic matter	0.12		
		Droughty	0.80		
		Too sandy	0.94		
Tapicito	20	Fair Reclamation Area		Good Source for Roadfill	
		Low content of organic matter	0.50		
		Sodium content	0.97		
		No water erosion limitation	0.99		
350:					
Hosta	85	Fair Reclamation Area		Poor Source for Roadfill	
		Droughty	0.85	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.87
370:					
Orlie	85	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.87
380:					
Teequee	60	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.12	Shrink-swell	0.40

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
380:					
Menefee	15	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.50		
Vessilla	15	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.12		
390:					
Losindios	35	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.96
Escrito	30	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.12		
Parkelei	25	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.99
403:					
Vosburg	55	Good Reclamation Area		Fair Source for Roadfill	
				Shrink-swell	0.87
Millpaw	35	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.12	Low strength	0.00
		Too clayey	0.50	Shrink-swell	0.71
		No water erosion limitation	0.99		
421:					
Argiustolls	45	Poor Reclamation Area		Poor Source for Roadfill	
		Stone content	0.00	Depth to bedrock	0.00
		Droughty	0.00	Stone content	0.00
		Depth to bedrock	0.00	Slope	0.00
		Cobble content	0.92	Cobble content	0.13

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
421:					
Ustorthents	35	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.50	Cobble content	0.05
		Cobble content	0.63	Stone content	0.87
		Stone content	0.92		
Rock Outcrop	15	Not rated		Not rated	
430:					
Wilmac, dry	55	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.08	Depth to bedrock	0.00
		Droughty	0.48	Low strength	0.00
		Too clayey	0.50		
		Depth to bedrock	0.58		
Hosta	35	Poor Reclamation Area		Poor Source for Roadfill	
		Salinity	0.00	Low strength	0.00
		Low content of organic matter	0.08	Shrink-swell	0.87
		No water erosion limitation	0.99		
440:					
Losindios	60	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.96
Jaythree	20	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.99
452:					
Gojiya	85	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.88	Low strength	0.00
		Sodium content	0.97	Shrink-swell	0.12

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
500:					
Escrito	45	Poor Reclamation Area		Poor Source for Roadfill	
		Depth to bedrock	0.00	Depth to bedrock	0.00
		Droughty	0.00		
		Low content of organic matter	0.12		
		No water erosion limitation	0.99		
Rock Outcrop	20	Not rated		Not rated	
Dulcepeak	20	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Droughty	0.11	Depth to bedrock	0.00
		Low content of organic matter	0.12	Shrink-swell	0.37
		Depth to bedrock	0.21		
501:					
Zau	55	Fair Reclamation Area		Poor Source for Roadfill	
		Droughty	0.06	Depth to bedrock	0.00
		Depth to bedrock	0.58		
		No water erosion limitation	0.99		
Lomapedro	35	Fair Reclamation Area		Poor Source for Roadfill	
		No water erosion limitation	0.99	Low strength	0.00
				Shrink-swell	0.72
				Depth to bedrock	0.92
515:					
Ustorthents	60	Poor Reclamation Area		Poor Source for Roadfill	
		Stone content	0.00	Stone content	0.00
		Droughty	0.00	Slope	0.00
		Low content of organic matter	0.50	Depth to bedrock	0.00
		Cobble content	0.80	Cobble content	0.02
Rock Outcrop	30	Not rated		Not rated	
523:					
Suposo	45	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.14

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
523:					
Ohwiler	40	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.88	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.87
524:					
Jicarilla	50	Fair Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.50	Low strength	0.00
				Shrink-swell	0.35
				Depth to saturated zone	0.88
Ohwiler	35	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.88	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.87
525:					
Jaythree	65	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.99
Cedarsprings	25	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.08	Shrink-swell	0.37
		Too clayey	0.12		
526:					
Hetz	85	Poor Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.00	Depth to saturated zone	0.50
				Shrink-swell	0.87
530:					
Wilmac	45	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.08	Depth to bedrock	0.00
		Too clayey	0.50	Low strength	0.00
		Depth to bedrock	0.58		
		Droughty	0.94		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
530:					
Hosta	25	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.12	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.87
Millpaw	15	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.12	Low strength	0.00
		Too clayey	0.50	Shrink-swell	0.12
		No water erosion limitation	0.99		
531:					
Horselake	50	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Low content of organic matter	0.12	Shrink-swell	0.79
		Droughty	0.88		
Menefee	30	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.50		
533:					
Badland	90	Not rated		Not rated	
540:					
Ishkoten	45	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Low strength	0.00
		Low content of organic matter	0.50	Slope	0.00
		Too clayey	0.50	Shrink-swell	0.87
Lajuita	25	Poor Reclamation Area		Poor Source for Roadfill	
		Too sandy	0.00	Slope	0.00
		Low content of organic matter	0.00	Depth to bedrock	0.00
		Droughty	0.00		
		Depth to bedrock	0.00		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
540:					
Escrito	20	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00		
		Low content of organic matter	0.12		
541:					
Ishkoten	55	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Slope	0.00
		Depth to bedrock	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.50	Shrink-swell	0.99
		Too clayey	0.50		
Lajuita	30	Poor Reclamation Area		Poor Source for Roadfill	
		Depth to bedrock	0.00	Slope	0.00
		Droughty	0.00	Depth to bedrock	0.00
				Shrink-swell	0.87
552:					
Haplustalfs	40	Poor Reclamation Area		Poor Source for Roadfill	
		Stone content	0.00	Slope	0.00
		Low content of organic matter	0.12	Stone content	0.00
		Droughty	0.93		
Argiustolls	30	Poor Reclamation Area		Poor Source for Roadfill	
		Stone content	0.00	Stone content	0.00
		Low content of organic matter	0.12	Slope	0.00
		Cobble content	0.93	Cobble content	0.14
		Droughty	0.99		
553:					
Haplustalfs	55	Poor Reclamation Area		Poor Source for Roadfill	
		Stone content	0.00	Slope	0.00
		Low content of organic matter	0.12	Stone content	0.00
		Droughty	0.72	Cobble content	0.28
		No cobble limitation	0.99		

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
553:					
Ustorthents	30	Poor Reclamation Area		Poor Source for Roadfill	
		Too sandy	0.00	Stone content	0.00
		Stone content	0.00	Depth to bedrock	0.00
		Droughty	0.00	Slope	0.00
		Low content of organic matter	0.00		
560:					
Herm	45	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.12	Shrink-swell	0.41
		No water erosion limitation	0.99		
Dulcepeak	40	Poor Reclamation Area		Poor Source for Roadfill	
		Too clayey	0.00	Low strength	0.00
		Droughty	0.11	Depth to bedrock	0.00
		Low content of organic matter	0.12	Shrink-swell	0.37
		Depth to bedrock	0.21		
571:					
Orlie	50	Fair Reclamation Area		Poor Source for Roadfill	
		Low content of organic matter	0.08	Low strength	0.00
		No water erosion limitation	0.99	Shrink-swell	0.87
Cementlake	35	Fair Reclamation Area		Poor Source for Roadfill	
		Sodium content	0.00	Low strength	0.00
		Low content of organic matter	0.12	Shrink-swell	0.58
		Too clayey	0.12		
580:					
Archmesa	60	Fair Reclamation Area		Fair Source for Roadfill	
		Low content of organic matter	0.08	Depth to bedrock	0.00
				Low strength	0.22
				Shrink-swell	0.99

Table 14b.--Construction Materials--Continued

Map symbol and soil name	Pct of map unit	Potential source of reclamation material		Potential source of roadfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value
580:					
Skyute	25	Poor Reclamation Area		Poor Source for Roadfill	
		Droughty	0.00	Depth to bedrock	0.00
		Low content of organic matter	0.00		
		Too sandy	0.00		
		Depth to bedrock	0.00		
590:					
Abreu Family	65	Poor Reclamation Area		Poor Source for Roadfill	
		Stone content	0.00	Stone content	0.00
		Cobble content	0.92	Slope	0.00
				Cobble content	0.13
Rubbleland	15	Not rated		Not rated	
Rock Outcrop	15	Not rated		Not rated	
600:					
Haplustepts	50	Poor Reclamation Area		Poor Source for Roadfill	
		Stone content	0.00	Depth to bedrock	0.00
		Droughty	0.00	Slope	0.00
		Depth to bedrock	0.00	Stone content	0.00
		Low content of organic matter	0.88	Cobble content	0.39
Haplustalfs	35	Poor Reclamation Area		Poor Source for Roadfill	
		Stone content	0.00	Stone content	0.00
		Low content of organic matter	0.12	Slope	0.00
		Droughty	0.98	Shrink-swell	0.87

Table 15.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5:							
Water	85	Not rated		Not rated		Not rated	
6:							
Miscellaneous Water	85	Not rated		Not rated		Not rated	
10:							
Elias	45	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
				Salinity	0.12		
				Seepage	0.01		
Canyada	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.40	Deep to water	1.00
				Seepage	0.22		
Sparank	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.26	Deep to water	1.00
				Seepage	0.03		
13:							
Doakum	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.30	Deep to water	1.00
				Seepage	0.03		
Betonnie	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.07	Deep to water	1.00
18:							
Sparham	85	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.52	Deep to water	1.00
19:							
Sparham	85	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.52	Deep to water	1.00
20:							
Menefee	35	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.78	Thin layer	1.00	Deep to water	1.00
		Slope	0.03				
Vessilla	30	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.74	Seepage	0.06		
		Slope	0.03				
Rock Outcrop	20	Not rated		Not rated		Not rated	

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
21:							
Badland	35	Not rated		Not rated		Not rated	
Menefee	35	Somewhat limited		Very limited		Very limited	
		Slope	0.88	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.78	Piping	0.02		
Rock Outcrop	20	Not rated		Not rated		Not rated	
23:							
Teromote	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Piping	1.00	Deep to water	1.00
				Hard to pack	1.00		
24:							
Orlie	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.12	Deep to water	1.00
Sparham	35	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.52	Deep to water	1.00
32:							
Doakum	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.30	Deep to water	1.00
				Seepage	0.03		
40:							
Parkelei	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.06	Deep to water	1.00
Menefee	20	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.78				
		Slope	0.03				
Vessilla	20	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.74	Thin layer	1.00	Deep to water	1.00
		Seepage	0.43	Seepage	0.06		
64:							
Dula	85	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.95	Cutbanks cave	1.00
				Seepage	0.50	Deep to water	0.02
69:							
Pinavetes	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.33	Deep to water	1.00
Florita	40	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.01	Deep to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
70:							
Blancot	30	Somewhat limited		Very limited		Very limited	
		Seepage	0.04	Piping	1.00	Deep to water	1.00
Councelor	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.04	Deep to water	1.00
Tsosie	30	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.90	Deep to water	1.00
104:							
Doakum	60	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
				Seepage	0.01		
Oro	25	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Deep to water	1.00
				Seepage	0.07		
105:							
Badland	50	Not rated		Not rated		Not rated	
Menefee	30	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.66				
		Slope	0.28				
107:							
Berryman	55	Not limited		Not limited		Very limited	
						Deep to water	1.00
Ruson	30	Not limited		Not limited		Very limited	
						Deep to water	1.00
108:							
Peney	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00				
		Slope	0.01				
Ransect	35	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.85	Thin layer	0.85	Deep to water	1.00
		Seepage	0.04	Piping	0.12		
115:							
Menefee	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.66				
		Slope	0.10				
119:							
Roques	45	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.12	Deep to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
119:							
Nusmag	35	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.12	Slow refill	1.00
						Deep to water	0.99
						Cutbanks cave	0.10
136:							
Elpedro	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.88	Deep to water	1.00
155:							
Vessilla	45	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.74	Seepage	0.07		
		Slope	0.04				
Menefee	25	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.66				
		Slope	0.04				
Orlie	20	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.50	Deep to water	1.00
156:							
Lindrith	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.16	Deep to water	1.00
Royosa	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.33	Deep to water	1.00
214:							
Quimera	60	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
		Slope	0.28	Piping	0.12		
Ishkoten	25	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.30	Thin layer	0.98	Deep to water	1.00
		Slope	0.21	Piping	0.72		
		Seepage	0.01				
220:							
Skyvillage	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
		Seepage	0.12	Seepage	0.07		
Eslendo	30	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.74	Thin layer	1.00	Deep to water	1.00
				Piping	0.12		
Rock Outcrop	30	Not rated		Not rated		Not rated	

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
229:							
Nusmag	45	Not limited		Somewhat limited		Very limited	
				Hard to pack	0.12	Slow refill	1.00
						Deep to water	0.99
						Cutbanks cave	0.10
Tottles	35	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Slow refill	1.00
				Hard to pack	0.10	Cutbanks cave	0.10
231:							
Sparham	85	Not limited		Very limited		Very limited	
				Hard to pack	1.00	Deep to water	1.00
				Salinity	0.50		
303:							
Orlie	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.12	Deep to water	1.00
304:							
Orlie	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.12	Deep to water	1.00
Nalivag	35	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.50	Piping	0.88	Deep to water	1.00
310:							
Rock Outcrop	40	Not rated		Not rated		Not rated	
Vessilla	30	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.74	Thin layer	1.00	Deep to water	1.00
		Slope	0.12	Seepage	0.06		
		Seepage	0.12				
Menefee	20	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.78				
		Slope	0.12				
340:							
Riverwash	50	Not rated		Not rated		Not rated	
Kwakina	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.16	Deep to water	1.00
Tapicito	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.09	Deep to water	1.00
				Piping	0.02		

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
350:							
Hosta	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.69	Deep to water	1.00
370:							
Orlie	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.50	Deep to water	1.00
380:							
Teequee	60	Not limited		Not limited		Very limited	
						Deep to water	1.00
Menefee	15	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.66				
		Slope	0.01				
Vessilla	15	Very limited		Very limited		Very limited	
		Seepage	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	0.74	Seepage	0.07		
		Slope	0.01				
390:							
Losindios	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.01	Deep to water	1.00
		Slope	0.03				
Escrito	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
		Seepage	0.12	Piping	1.00		
Parkelei	25	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.06	Deep to water	1.00
403:							
Vosburg	55	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.38	Deep to water	1.00
				Seepage	0.03		
Millpaw	35	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.57	Deep to water	1.00
421:							
Argiustolls	45	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Deep to water	1.00
		Depth to bedrock	1.00	Content of large stones	1.00		
		Seepage	0.81				

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
421:							
Ustorthents	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Content of large stones	0.99	Deep to water	1.00
		Slope	1.00	Thin layer	0.81		
		Depth to bedrock	0.81				
Rock Outcrop	15	Not rated		Not rated		Not rated	
430:							
Wilmac, dry	55	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.85	Deep to water	1.00
				Piping	0.71		
Hosta	35	Not limited		Somewhat limited		Very limited	
				Piping	0.39	Deep to water	1.00
440:							
Losindios	60	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.01	Deep to water	1.00
Jaythree	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.04	Deep to water	1.00
452:							
Gojiya	85	Somewhat limited		Very limited		Very limited	
		Seepage	0.02	Ponding	1.00	Deep to water	1.00
				Hard to pack	0.25		
500:							
Escrito	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
		Seepage	0.12	Piping	1.00		
		Slope	0.03				
Rock Outcrop	20	Not rated		Not rated		Not rated	
Dulcepeak	20	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.96	Thin layer	0.96	Deep to water	1.00
		Seepage	0.12				
		Slope	0.03				
501:							
Zau	55	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.85	Deep to water	1.00
		Seepage	0.04				
Lomapedro	35	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.13	Deep to water	1.00
		Depth to bedrock	0.01	Thin layer	0.02		

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
515:							
Ustorthents	60	Very limited		Very limited		Very limited	
		Slope	1.00	Content of large stones	1.00	Deep to water	1.00
		Seepage	1.00	Thin layer	0.91		
		Depth to bedrock	0.17				
Rock Outcrop	30	Not rated		Not rated		Not rated	
523:							
Suposo	45	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Hard to pack	0.11	Deep to water	1.00
Ohwiler	40	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.24	Deep to water	1.00
				Seepage	0.01		
524:							
Jicarilla	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.12	Depth to saturated zone	0.87	Slow refill	0.88
				Piping	0.27	Cutbanks cave	0.10
						Deep to water	0.06
Ohwiler	35	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.24	Deep to water	1.00
				Seepage	0.01		
525:							
Jaythree	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.04	Deep to water	1.00
Cedarsprings	25	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.12	Piping	0.43	Deep to water	1.00
526:							
Hetz	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.04	Ponding	1.00	Slow refill	0.96
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.91		
530:							
Wilmac	45	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.11	Thin layer	0.85	Deep to water	1.00
				Piping	0.12		
Hosta	25	Not limited		Somewhat limited		Very limited	
				Piping	0.12	Deep to water	1.00
Millpaw	35	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.02	Piping	0.57	Deep to water	1.00

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
531:							
Horselake	50	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.03	Thin layer	0.66	Deep to water	1.00
		Seepage	0.02	Hard to pack	0.19		
Menefee	30	Somewhat limited		Very limited		Very limited	
		Depth to bedrock	0.78	Thin layer	1.00	Deep to water	1.00
		Slope	0.03				
533:							
Badland	90	Not rated		Not rated		Not rated	
540:							
Ishkoten	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Thin layer	0.74	Deep to water	1.00
		Depth to bedrock	0.05	Piping	0.71		
		Seepage	0.01				
Lajuita	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
		Slope	0.28	Seepage	0.01		
		Seepage	0.12				
Escrito	20	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
		Seepage	0.12	Piping	1.00		
		Slope	0.03				
541:							
Ishkoten	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.72	Piping	0.97	Deep to water	1.00
		Depth to bedrock	0.17	Thin layer	0.91		
		Seepage	0.01				
Lajuita	30	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
		Slope	0.28	Seepage	0.01		
		Seepage	0.12				
552:							
Haplustalfs	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	Deep to water	1.00
		Slope	1.00				
Argiustolls	30	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	Deep to water	1.00
		Slope	1.00				
553:							
Haplustalfs	55	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	Deep to water	1.00
		Slope	1.00				

Table 15.--Water Management--Continued

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer-fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
553:							
Ustorthents	30	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	Deep to water	1.00
		Slope	1.00	Thin layer	1.00		
		Depth to bedrock	0.90				
560:							
Herm	45	Not limited		Somewhat limited		Very limited	
				Piping	0.24	Deep to water	1.00
Dulcepeak	40	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.95	Thin layer	0.95	Deep to water	1.00
		Slope	0.28				
		Seepage	0.12				
571:							
Orlie	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.04	Piping	0.12	Deep to water	1.00
Cementlake	35	Somewhat limited		Very limited		Very limited	
		Seepage	0.01	Piping	1.00	Deep to water	1.00
580:							
Archmesa	60	Somewhat limited		Somewhat limited		Very limited	
		Depth to bedrock	0.69	Piping	0.88	Deep to water	1.00
		Seepage	0.04	Thin layer	0.70		
Skyute	25	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Deep to water	1.00
				Piping	1.00		
590:							
Abreu Family	65	Very limited		Very limited		Very limited	
		Slope	1.00	Content of large stones	1.00	Deep to water	1.00
		Depth to bedrock	1.00				
		Seepage	0.81				
Rubbleland	15	Not rated		Not rated		Not rated	
Rock Outcrop	15	Not rated		Not rated		Not rated	
600:							
Haplustepts	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Content of large stones	1.00	Deep to water	1.00
		Slope	1.00	Thin layer	0.34		
		Depth to bedrock	0.33				
Haplustalfs	35	Very limited		Very limited		Very limited	
		Slope	1.00	Content of large stones	1.00	Deep to water	1.00
		Seepage	0.72				

Table 16.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5:												
Water	---	---	---	---	---	---	---	---	---	---	---	---
6:												
Miscellaneous Water	---	---	---	---	---	---	---	---	---	---	---	---
10:												
Elias	0-1	Fine sandy loam	ML, SM, SC-SM	A-4	0	0	100	100	70-85	40-55	20-25	NP-5
	1-10	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	10-36	Very fine sandy loam, fine sandy loam	ML, CL-ML	A-4	0	0	100	100	85-95	50-65	20-25	NP-5
	36-80	Loam, stratified fine sandy loam	ML, SM, SC-SM	A-4	0	0	100	100	70-85	40-55	20-25	NP-5
Canyada	0-1	Silty clay	MH, ML	A-7	0	0	100	100	95-100	90-95	45-70	15-35
	1-16	Clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-95	40-60	15-35
	16-41	Fine sandy loam	CL-ML, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
	41-80	Fine sand, sand	SP-SM, SM	A-2-4, A-3	0	0	100	100	50-80	5-35	20-25	NP-5
Sparank	0-3	Silty clay loam	ML	A-7-6, A-6	0	0	100	100	90-100	85-95	30-45	5-15
	3-14	Silty clay	ML, MH	A-7	0	0	100	100	95-100	90-95	45-55	15-20
	14-44	Silty clay loam, clay loam	CL	A-6	0	0	100	100	90-100	70-95	35-40	15-20
	44-60	Silty clay	MH, ML	A-7	0	0	100	100	95-100	90-95	45-55	15-20
	60-80	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-90	35-55	30-35	10-15
13:												
Doakum	0-4	Very fine sandy loam	ML	A-4	0	0	100	100	85-95	50-65	20-25	NP-5
	4-12	Sandy clay loam, clay loam	SC, CL	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	12-53	Fine sandy loam, very fine sandy loam, sandy clay loam	SC, CL-ML, SC-SM	A-4	0	0	100	100	70-90	35-55	20-30	5-10
	53-80	Very fine sandy loam, fine sandy loam, loamy fine sand	ML, SC-SM, SM	A-2-4, A-4	0	0	100	100	70-95	30-65	20-25	NP-5

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
13:												
Betonnie	0-4	Fine sandy loam	SM, SC-SM	A-4	0	0	100	95-100	70-85	40-55	20-30	NP-5
	4-17	Fine sandy loam, sandy loam	SC, SC-SM	A-4, A-2-4	0	0	100	95-100	60-85	30-55	25-30	5-10
	17-50	Fine sandy loam, sandy loam	SC, SC-SM	A-4, A-2-4	0	0	100	95-100	60-85	30-55	25-30	5-10
	50-80	Sandy loam, fine sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	95-100	60-85	30-55	20-25	NP-5
18:												
Sparham	0-2	Clay	CH, CL	A-7	0	0	85-100	75-100	70-90	60-80	45-60	20-30
	2-80	Clay loam, silty clay, silty clay loam	CH, CL	A-7	0	0	85-100	75-100	70-95	65-90	40-60	20-30
19:												
Sparham	0-9	Silt loam	CL	A-6	0	0	85-100	75-100	70-85	65-80	30-35	10-15
	9-80	Clay loam, silty clay, silty clay loam	CH, CL	A-7	0	0	85-100	75-100	70-95	65-90	40-60	20-30
20:												
Menefee	0-3	Clay loam	CL	A-6, A-7-6	0	0-10	95-100	95-100	90-100	70-80	35-45	15-20
	3-9	Clay loam	CL	A-6, A-7-6	0	0-5	100	100	90-100	70-80	35-45	15-20
	9	Weathered bedrock			---	---	---	---	---	---	---	---
Vessilla	0-1	Sandy loam	SC-SM, SM	A-2, A-4	0-5	0-5	90-100	85-100	50-70	30-40	15-20	NP-5
	1-9	Sandy loam, fine sandy loam	SC-SM, SM	A-2, A-4	0	0	90-100	85-100	50-70	30-40	15-20	NP-5
	9	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Rock Outcrop	0-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
21:												
Badland	0-80	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
Menefee	0-2	Clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	15-20
	2-8	Clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	15-20
	8	Weathered bedrock			---	---	---	---	---	---	---	---
Rock Outcrop	0-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
23:												
Teromote	0-19	Silty clay loam	ML	A-4, A-6, A-7-6	0	0	100	100	80-100	75-95	30-45	5-15
	19-40	Stratified fine sandy loam to silty clay loam	CL-ML, SC-SM, CL	A-4	0	0	100	100	70-100	40-95	25-30	5-10
	40-80	Stratified clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
24:												
Orlie	0-2	Fine sandy loam	CL-ML, SC-SM	A-4	0	0	80-100	75-100	60-75	35-55	25-30	5-10
	2-25	Clay loam, silty clay loam	CL	A-6	0	0	80-100	75-100	75-95	70-85	35-40	15-20
	25-80	Clay loam, sandy clay loam, silty clay loam	CL	A-6	0	0	80-100	75-100	70-85	50-80	35-40	15-20
Sparham	0-3	Clay	CH, CL	A-7	0	0	85-100	75-100	70-90	60-80	45-60	20-30
	3-80	Clay loam, silty clay, silty clay loam	CH, CL	A-7	0	0	85-100	75-100	70-95	65-90	40-60	20-30
32:												
Doakum	0-4	Very fine sandy loam	ML	A-4	0	0	100	100	85-95	50-65	20-25	NP-5
	4-12	Sandy clay loam, clay loam	SC, CL	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	12-53	Fine sandy loam, very fine sandy loam, sandy clay loam	CL-ML, SC, SC-SM	A-4	0	0	100	100	70-90	35-55	20-30	5-10
	53-80	Very fine sandy loam, fine sandy loam, loamy fine sand	ML, SM, SC-SM	A-2-4, A-4	0	0	100	100	70-95	30-65	20-25	NP-5
40:												
Parkelei	0-2	Fine sandy loam	CL-ML, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
	2-38	Sandy clay loam, clay loam	CL, SC	A-6	0	0	100	100	75-85	45-55	30-40	10-20
	38-80	Sandy loam, sandy clay loam	SC, SC-SM	A-2, A-6, A-4	0	0	100	100	65-80	30-50	20-30	5-15
Menefee	0-3	Clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	15-20
	3-9	Clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	15-20
	9	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
40:												
Vessilla	0-3	Sandy loam	SC-SM, SM	A-2, A-4	0	0	90-100	85-100	50-70	30-40	15-20	NP-5
	3-17	Sandy loam	SC-SM, SM	A-2, A-4	0	0	90-100	85-100	50-70	30-40	15-20	NP-5
	17-27	Unweathered bedrock			---	---	---	---	---	---	---	---
64:												
Dula	0-11	Loam	CL	A-6	0	0	100	100	85-95	60-80	25-30	10-15
	11-28	Loam	CL	A-6	0	0	100	100	75-90	60-80	25-30	10-15
	28-80	Extremely gravelly coarse sand, extremely gravelly sand	GW-GM, GW	A-1	0-5	15-40	25-35	15-30	5-20	0-10	20-25	NP-5
69:												
Pinavetes	0-2	Loamy sand	SC-SM, SM	A-2-4	0	0	100	100	50-75	15-30	20-25	NP-5
	2-80	Loamy sand, sand	SC-SM, SM, SP-SM	A-2-4, A-3	0	0	100	100	50-75	5-30	20-25	NP-5
Florita	0-31	Fine sandy loam	SC, SC-SM	A-4	0	0	100	95-100	70-85	40-55	25-30	5-10
	31-41	Sandy loam	SM, SC-SM	A-2-4, A-4	0	0	100	100	60-70	30-40	15-20	NP-5
	41-80	Fine sandy loam	SC, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
70:												
Blancot	0-7	Loam	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	25-30	5-10
	7-26	Clay loam, sandy clay loam	SC, CL	A-6	0	0	100	100	80-100	45-80	30-35	10-15
	26-80	Clay loam, sandy clay loam, sandy loam	CL	A-4, A-6	0	0	100	100	60-90	30-80	25-30	5-15
Councelor	0-2	Fine sandy loam	SC-SM, SM	A-4	0	0	100	100	70-85	40-55	15-25	NP-5
	2-32	Fine sandy loam, sandy loam	SC-SM, SM	A-2-4, A-4	0	0	100	100	60-85	30-55	15-25	NP-5
	32-60	Loamy fine sand	SM	A-4, A-2-4	0	0	95-100	90-100	70-85	30-55	20-25	NP-5
	60-80	Sandy clay loam	SC	A-4	0	0	100	100	80-90	35-55	25-30	5-10
Tsosie	0-2	Clay loam	CL	A-6	0	0	100	100	85-95	75-85	30-40	15-20
	2-36	Loam, clay loam, sandy clay loam	CL	A-6	0	0	80-100	75-100	70-100	50-85	25-40	10-20
	36-80	Stratified sandy loam to silty clay loam	CL	A-6	0	0	85-100	75-90	60-75	50-65	25-40	10-20

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
104:												
Doakum	0-3	Fine sandy loam	SC-SM	A-4	0	0	100	100	95-100	45-55	20-30	5-10
	3-33	Sandy clay loam, clay loam	CL	A-6	0	0	100	100	95-100	50-60	35-40	15-20
	33-55	Sandy clay loam, fine sandy loam	SC, SC-SM	A-4	0	0	100	100	95-100	45-55	20-30	5-10
	55-80	Very fine sandy loam, fine sandy loam	CL-ML, SC, SM, SC-SM	A-4	0	0	100	100	95-100	45-55	15-25	NP-10
Oro	0-2	Clay loam	CL	A-6	0	0	100	100	85-100	60-80	25-30	10-15
	2-25	Clay	CL	A-7-6	0	0	100	100	90-100	70-95	35-45	15-25
	25-39	Fine sandy loam	SM, SC-SM	A-4	0	0	100	95-100	70-85	40-55	20-25	NP-5
	39-80	Loamy fine sand	SM, SC-SM	A-2-4, A-4	0	0	100	100	70-85	30-55	20-25	NP-5
105:												
Badland	0-80	Weathered bedrock			---	---	---	---	---	---	---	---
Menefee	0-4	Loam	CL	A-6	0	0	100	100	80-90	70-80	30-35	10-15
	4-10	Clay loam	CL	A-6	0	0	90-100	85-100	75-90	65-80	35-40	15-20
	10	Weathered bedrock			---	---	---	---	---	---	---	---
107:												
Berryman	0-3	Silt loam	CL-ML	A-4	0	0	100	100	90-100	75-90	25-30	5-10
	3-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	90-100	80-90	35-45	15-25
Ruson	0-2	Silt loam	CL-ML	A-4	0	0	80-100	75-100	70-85	65-80	25-30	5-10
	2-19	Silty clay loam, clay loam	CL	A-6	0	0	80-100	75-100	70-95	70-85	35-40	15-20
	19-80	Silty clay, clay	CH, CL	A-7	0	0	80-100	75-100	75-95	75-90	40-55	15-30
108:												
Peney	0-3	Channery loam	CL-ML, GC-GM	A-4	0	0	55-75	50-70	45-60	40-55	25-30	5-10
	3-10	Loam, silt loam, clay loam	CL, CL-ML	A-4, A-6	0	0	80-100	75-100	70-90	65-80	25-35	5-15
	10	Unweathered bedrock			---	---	---	---	---	---	---	---
Ransect	0-3	Silty clay loam	CL	A-6	0	0	100	100	85-100	80-95	35-40	15-20
	3-38	Clay loam	CL	A-6	0	0	100	100	85-95	70-90	35-40	15-20
	38-42	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
115:												
Menefee	0-2	Channery loam	GC, CL, SC	A-6	0	0-10	70-85	60-75	50-65	40-55	30-35	10-15
	2-11	Clay loam	CL	A-6	0	0	90-100	85-100	75-90	65-80	35-40	15-20
	11	Weathered bedrock			---	---	---	---	---	---	---	---
119:												
Roques	0-2	Clay loam	CL	A-7	0	0	100	100	85-95	75-85	40-45	15-20
	2-80	Clay	CH, CL	A-7	0	0	100	100	90-100	80-90	45-60	20-30
Nusmag	0-2	Clay loam	CL	A-7	0	0	100	100	70-85	60-75	40-45	15-20
	2-18	Clay	CH, CL	A-7	0	0	100	100	70-85	65-80	45-60	20-30
	18-80	Clay	CH, CL	A-7	0	0	100	100	70-85	65-80	45-60	20-30
136:												
Elpedro	0-3	Silt loam	CL-ML	A-4	0	0	95-100	90-100	85-95	75-85	25-30	5-10
	3-80	Silty clay loam, silt loam, loam	CL	A-6	0	0	95-100	90-100	80-95	70-90	30-40	10-15
155:												
Vessilla	0-1	Sandy loam	SC-SM	A-2	0-5	0-10	100	100	60-75	25-35	20-30	5-10
	1-15	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0-5	0-10	90-100	85-100	60-80	25-40	15-25	5-10
	15	Unweathered bedrock			---	---	---	---	---	---	---	---
Menefee	0-3	Clay loam	CL	A-6	0	0	100	100	80-90	70-85	35-40	15-20
	3-10	Clay loam	CL	A-6	0	0	90-100	85-100	75-90	65-80	35-40	15-20
	10	Weathered bedrock			---	---	---	---	---	---	---	---
Orlie	0-4	Fine sandy loam	SC, SC-SM	A-2, A-4	0	0	100	100	60-70	30-40	20-30	5-10
	4-32	Sandy clay loam, clay loam	CL, SC	A-6, A-7	0	0	100	100	80-95	35-80	30-45	10-20
	32-80	Sandy clay loam, clay loam	CL, SC	A-6, A-2, A-7	0	0	95-100	85-90	20-90	20-80	30-45	10-20
156:												
Lindrith	0-7	Loam	CL	A-6	0	0	100	100	80-100	60-85	30-35	10-15
	7-60	Fine sandy loam	SC, SC-SM	A-2, A-4	0	0	95-100	85-100	75-90	30-50	20-25	5-10
	60-80	Fine sand	SC-SM, SM, SP-SM	A-3, A-2, A-4	0	0	100	100	75-90	5-40	15-20	NP-5
Royosa	0-2	Loamy fine sand	SM	A-2	0	0	100	100	50-75	15-30	0-14	NP
	2-80	Loamy sand, loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	100	50-75	5-30	0-14	NP

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
214:												
Quimera	0-3	Very channery clay loam	GC	A-2	0	0	30-55	25-50	20-40	15-35	35-45	15-20
	3-15	Clay loam	CL	A-7	0	0	90-100	85-100	65-80	60-75	40-45	15-20
	15-17	Clay	CH, CL	A-7	0	0	90-100	85-100	70-85	65-80	45-55	20-30
	17	Unweathered bedrock			---	---	---	---	---	---	---	---
Ishkoten	0-3	Cobbly loam	CL-ML, SC-SM, CL, SC	A-2-4, A-4	0-25	0-25	75-90	70-85	45-80	25-65	25-30	5-10
	3-17	Cobbly sandy clay, clay, clay loam	CL, SC, GC	A-7-6, A-6	0-5	0-25	75-90	70-85	60-85	35-85	35-45	15-20
	17-24	Clay loam, sandy clay loam	CL, SC, CL-ML, SC-SM	A-6, A-4	0	0	95-100	90-100	80-100	35-80	25-40	5-15
	24	Weathered bedrock			---	---	---	---	---	---	---	---
220:												
Skyvillage	0-4	Sandy loam	SC, SC-SM	A-2-4, A-4	0-5	0-5	95-100	95-100	60-70	30-40	20-25	5-10
	4-16	Sandy loam	SC, SC-SM	A-2-4, A-4	0-5	0-5	95-100	95-100	60-70	30-40	20-25	5-10
	16	Unweathered bedrock			---	---	---	---	---	---	---	---
Eslendo	0-13	Silty clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	70-95	35-45	15-20
	13	Weathered bedrock			---	---	---	---	---	---	---	---
Rock Outcrop	0-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
229:												
Nusmag	0-2	Clay loam	CL	A-7	0	0	100	100	70-85	60-75	40-45	15-20
	2-18	Clay	CH, CL	A-7	0	0	100	100	70-85	65-80	45-60	20-30
	18-80	Clay	CH, CL	A-7	0	0	100	100	70-85	65-80	45-60	20-30
Tottles	0-6	Clay loam	CL	A-6	0	0	100	100	80-90	70-85	35-40	15-20
	6-21	Clay	CH, CL	A-7	0	0	100	100	85-95	75-90	45-55	20-25
	21-80	Clay	CH, CL	A-7	0	0	100	100	90-100	85-95	45-60	20-30
231:												
Sparham	0-2	Clay loam	CL	A-7	0	0	85-100	75-100	70-85	60-75	40-45	15-20
	2-35	Clay loam, silty clay, silty clay loam	CH, CL	A-7	0	0	85-100	75-100	70-90	65-85	40-60	20-30
	35-80	Clay	CH, CL	A-7	0	0	85-100	75-100	70-90	60-80	45-60	20-30

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
303:												
Orlie	0-2	Loam	CL	A-6	0	0	80-100	75-100	70-80	60-70	30-35	10-15
	2-22	Clay loam, silty clay loam	CL	A-6	0	0	80-100	75-100	75-95	70-85	35-40	15-20
	22-80	Clay loam, sandy clay loam, silty clay loam	CL	A-6	0	0	80-100	75-100	70-85	50-80	35-40	15-20
304:												
Orlie	0-4	Loam	CL	A-6	0	0	80-100	75-100	70-80	60-70	30-35	10-15
	4-26	Clay loam, silty clay loam	CL	A-6	0	0	80-100	75-100	75-95	70-85	35-40	15-20
	26-80	Clay loam, sandy clay loam, silty clay loam	CL	A-6	0	0	80-100	75-100	70-85	50-80	35-40	15-20
Nalivag	0-3	Loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	3-10	Sandy clay loam, clay loam	SC, SC-SM	A-4, A-6	0	0	100	100	80-90	35-55	25-35	5-15
	10-39	Loam, silty clay loam	CL	A-6	0	0	100	100	85-100	60-95	30-35	10-15
	39-80	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
310:												
Rock Outcrop	0-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Vessilla	0-12	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	90-100	85-100	50-70	30-40	15-20	NP-5
	12-22	Unweathered bedrock			---	---	---	---	---	---	---	---
Menefee	0-2	Loam	CL	A-6	0-15	0-10	95-100	95-100	85-95	60-75	30-40	10-15
	2-6	Clay loam	CL	A-6, A-7-6	0-10	0-10	95-100	95-100	90-100	70-80	35-45	15-20
	6	Weathered bedrock			---	---	---	---	---	---	---	---
340:												
Riverwash	0-6	Coarse sand	SP-SM, SW, SP, SW-SM	A-1, A-3	0	0-5	100	90-100	30-60	0-10	0-14	NP
	6-80	Stratified coarse sand to sandy loam	SP, SM, SP-SM	A-1, A-3, A-2	0	0-5	100	90-100	40-70	0-20	0-14	NP
Kwakina	0-2	Loamy sand	SM	A-2-4	0	0	100	100	50-75	15-30	15-20	NP-5
	2-80	Loamy sand, loamy fine sand	SC-SM, SM	A-2-4	0	0	100	100	50-75	15-30	15-20	NP-5

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
340:												
Tapicito	0-3	Very fine sandy loam	CL-ML, ML	A-4	0	0	100	100	85-95	50-65	20-25	NP-5
	3-39	Fine sandy loam, very fine sandy loam, sandy clay loam	SM, SC-SM, ML	A-4	0	0	100	100	70-95	40-65	20-25	NP-5
	39-80	Loamy fine sand, loamy sand	SM, SC-SM	A-2-4, A-4	0	0	100	100	50-85	15-50	20-25	NP-5
350:												
Hosta	0-2	Loam	CL-ML, CL	A-4	0	0	100	95-100	85-95	60-75	25-35	5-15
	2-27	Clay, clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	35-40	15-20
	27-80	Clay loam, loam	CL	A-6	0	0	100	95-100	85-95	60-75	25-35	10-15
370:												
Orlie	0-3	Fine sandy loam	SC, SC-SM	A-2, A-4	0	0	100	100	60-70	30-40	20-30	5-10
	3-18	Clay loam, sandy clay loam	CL, SC	A-6, A-7	0	0	100	100	80-95	35-80	30-45	10-20
	18-80	Loam, fine sandy loam	CL, SC	A-2, A-7, A-6	0	0	95-100	85-90	20-90	20-80	30-45	10-20
380:												
Teequee	0-2	Cobbly clay loam	CL-ML, CL, SC-SM	A-6, A-4	0-10	15-45	70-90	70-85	60-85	45-70	25-35	5-15
	2-51	Clay	CH, CL	A-7-6	0	0	100	100	90-100	75-95	40-60	15-35
	51	Weathered bedrock			---	---	---	---	---	---	---	---
Menefee	0-2	Clay loam	CL	A-6	0	0	100	100	80-90	70-85	35-40	15-20
	2-10	Clay loam	CL	A-6	0	0	90-100	85-100	75-90	65-80	35-40	15-20
	10	Weathered bedrock			---	---	---	---	---	---	---	---
Vessilla	0-2	Fine sandy loam	SC-SM	A-2, A-4	0-5	0-10	90-100	85-100	70-80	30-40	20-30	5-10
	2-10	Sandy loam, fine sandy loam	SC-SM	A-2, A-4	0-5	0-10	90-100	85-100	60-80	25-40	15-25	5-10
	10	Unweathered bedrock			---	---	---	---	---	---	---	---
390:												
Losindios	0-2	Sandy loam	SC, SC-SM	A-2-4, A-4	0	0	90-100	85-100	55-75	30-45	25-30	5-10
	2-37	Sandy clay loam	SC-SM, SC, CL-ML	A-4, A-2-4, A-6	0	0	85-100	80-100	65-90	30-55	25-35	5-15
	37-80	Sandy loam, sandy clay loam	SC-SM, SC	A-2-4, A-4	0	0	85-100	80-100	50-90	25-55	25-30	5-10
Escrito	0-4	Sandy loam	SC-SM	A-2, A-4	0-10	0-15	95-100	90-100	65-75	30-50	20-30	5-10
	4-16	Sandy loam, loam	CL-ML, SC-SM	A-4	0-10	0-15	95-100	90-100	65-85	45-60	25-30	5-10
	16	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
390:												
Parkelei--------	0-2	Fine sandy loam	CL-ML, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
	2-38	Sandy clay loam, clay loam	CL, SC	A-6	0	0	100	100	75-85	45-55	30-40	10-20
	38-80	Sandy loam, sandy clay loam	SC, SC-SM	A-4, A-2, A-6	0	0	100	100	65-80	30-50	20-30	5-15
403:												
Vosburg---------	0-3	Fine sandy loam	CL-ML, SC-SM	A-4	0	0	100	100	70-85	40-55	25-30	5-10
	3-25	Clay loam, sandy clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	35-40	15-20
	25-35	Sandy clay loam	CL, SC	A-6	0	0	100	95-100	80-90	35-55	30-40	10-20
	35-80	Sandy clay loam	CL, SC	A-6	0	0	100	95-100	80-90	35-55	30-40	10-20
Millpaw---------	0-3	Loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	3-23	Clay loam, clay	CL	A-7	0	0	100	100	90-100	70-95	40-50	20-25
	23-80	Clay loam, loam	CL	A-6	0	0	100	90-100	85-100	60-80	30-35	10-15
421:												
Argiustolls-----	0-23	Very flaggy loam	SC, SC-SM	A-4	5-15	35-55	85-95	70-80	45-80	35-55	25-30	5-10
	23-40	Very flaggy clay loam	CL	A-6	5-15	35-55	85-95	55-75	50-75	40-60	35-45	15-25
	40-80	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
Ustorthents-----	0-4	Very cobbly sandy loam	SC, SC-SM	A-1-b, A-2-4	0-25	20-70	60-90	55-80	35-60	20-35	25-30	5-10
	4-16	Cobbly loam	SC, SC-SM	A-4	0-10	15-45	75-90	70-80	60-80	45-65	25-30	5-10
	16-32	Very cobbly sandy loam	SC-SM, SC	A-2-4, A-1-b	0-25	20-70	45-90	40-85	25-60	15-35	25-30	5-10
	32-42	Bedrock			---	---	---	---	---	---	---	---
Rock Outcrop----	0-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
430:												
Wilmac, dry-----	0-3	Clay loam	CL	A-4	0	0-10	90-100	85-100	80-90	60-80	25-30	5-10
	3-11	Clay loam, clay	CL	A-6, A-7-6	0	0	100	100	90-100	70-95	35-45	15-20
	11-26	Parachannery clay	CL	A-6, A-7-6	0	0	85-100	80-100	75-100	60-95	35-45	15-20
	26	Bedrock			---	---	---	---	---	---	---	---
Hosta----------	0-4	Clay loam	CL	A-6	0	0	100	100	85-100	60-80	25-35	5-15
	4-17	Clay	CL	A-6	0	0	100	100	90-100	70-95	35-45	15-25
	17-80	Clay, clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-45	10-20
440:												
Losindios-------	0-2	Sandy loam	SC, SC-SM	A-4, A-2-4	0	0	90-100	85-100	55-75	30-45	25-30	5-10
	2-37	Sandy clay loam	SC, SC-SM	A-6, A-2-4, A-4	0	0	85-100	80-100	65-90	30-55	25-35	5-15
	37-80	Sandy loam, sandy clay loam	SC, SC-SM	A-4, A-2-4	0	0	85-100	80-100	50-90	25-55	25-30	5-10

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
440:												
Jaythree--------	0-2	Sandy loam	CL-ML, SC-SM, SC	A-4, A-2-4	0	0	85-100	80-100	50-95	25-75	25-30	5-10
	2-24	Sandy clay loam	CL-ML, SC, SC-SM	A-2-4, A-4, A-2-6, A-6	0	0	85-100	80-100	65-90	30-55	20-35	5-15
	24-80	Sandy clay loam, sandy loam	SC, CL-ML, SC-SM	A-4, A-2-4	0	0	85-100	80-100	50-90	25-55	25-30	5-10
452:												
Gojiya----------	0-50	Silty clay	CH, CL	A-7	0	0	100	100	90-100	75-95	40-65	15-30
	50-80	Silty clay loam, silty clay	CH, CL	A-6, A-7-6	0	0	100	100	90-100	75-95	30-65	20-45
500:												
Escrito---------	0-6	Very fine sandy loam	SC-SM, CL-ML	A-4	0-10	0-10	85-100	80-100	70-90	40-65	25-30	5-10
	6-16	Fine sandy loam, loam	SC-SM, CL-ML	A-4	0-10	0-10	85-100	80-100	50-90	45-60	25-30	5-10
	16	Unweathered bedrock			---	---	---	---	---	---	---	---
Rock Outcrop----	0-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Dulcepeak-------	0-12	Fine sandy loam	SC-SM	A-4	0-10	0-10	85-100	80-100	55-85	35-55	20-30	5-10
	12-25	Clay, clay loam	CL	A-6, A-7	0	0-5	100	100	90-100	75-95	40-60	20-35
	25	Unweathered bedrock			---	---	---	---	---	---	---	---
501:												
Zau----------	0-13	Loam	CL	A-6	0	0	100	95-100	85-100	60-75	25-35	10-15
	13-16	Loam	CL	A-6	0	0	100	95-100	65-90	60-75	25-35	10-15
	16-21	Clay	CH, CL	A-7	0	0	100	90-100	55-90	55-90	45-55	20-25
	21	Weathered bedrock			---	---	---	---	---	---	---	---
Lomapedro-------	0-20	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	55-80	50-75	20-35	5-15
	20-26	Clay loam	CL	A-6, A-7	0	0-3	100	95-100	60-95	55-85	35-45	15-20
	26-37	Clay, clay loam	CL, MH, CH, ML	A-7	0	0-3	100	95-100	75-95	70-90	45-55	20-25
	37-52	Clay loam	CL, MH, CH, ML	A-7	0-20	0-10	95-100	95-100	75-95	70-90	45-55	20-25
	52	Weathered bedrock			---	---	---	---	---	---	---	---
515:												
Ustorthents-----	0-28	Very cobbly sandy loam	SC, SC-SM, GC-GM	A-1-b, A-2-4	10-70	20-70	45-90	40-85	25-60	15-35	25-30	5-10
	28	Bedrock			---	---	---	---	---	---	---	---
Rock Outcrop----	0-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
523:												
Suposo	0-3	Loam	CL	A-4, A-6	0	0	100	100	85-95	60-75	20-35	5-15
	3-11	Clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-95	70-80	20-35	5-15
	11-50	Clay	CH, CL	A-7	0	0	100	100	90-100	75-95	45-60	20-30
	50-80	Clay loam, clay	CH, CL	A-7	0	0-5	95-100	95-100	90-100	70-90	40-60	20-30
Ohwiler	0-7	Loam	CL-ML, CL	A-6	0	0	100	100	85-95	60-75	25-35	5-15
	7-22	Loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	22-62	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-80	35-45	15-20
	62-80	Sandy clay loam	SC-SM, SC, CL	A-6	0	0	100	100	90-100	35-60	25-45	10-20
524:												
Jicarilla	0-3	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-35	10-15
	3-32	Clay, clay loam, silty clay	CL	A-7-6, A-6	0	0	100	100	90-100	70-95	35-45	15-20
	32-42	Silty clay, clay, clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-95	35-45	15-20
	42-80	Stratified Sandy clay loam, clay	CL, SC	A-6, A-7-6	0	0	100	100	80-100	35-95	30-45	10-20
Ohwiler	0-7	Loam	CL, CL-ML	A-6	0	0	100	100	85-95	60-75	25-35	5-15
	7-22	Loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	22-62	Clay loam	CL	A-6, A-7	0	0	100	100	90-100	70-80	35-45	15-20
	62-80	Sandy clay loam	SC-SM, CL, SC	A-6	0	0	100	100	90-100	35-60	25-45	10-20
525:												
Jaythree	0-2	Sandy loam	SC, SC-SM, CL-ML	A-4, A-2-4	0	0	85-100	80-100	50-95	25-75	25-30	5-10
	2-24	Sandy clay loam	SC, CL-ML, SC-SM	A-4, A-2-6, A-2-4, A-6	0	0	85-100	80-100	65-90	30-55	20-35	5-15
	24-80	Sandy clay loam, sandy loam	CL-ML, SC-SM, SC	A-4, A-2-4	0	0	85-100	80-100	50-90	25-55	25-30	5-10
Cedarsprings	0-9	Loam	CL-ML, CL	A-4	0	0	100	90-100	85-95	60-75	25-30	5-10
	9-19	Clay loam	CL	A-6	0	0	100	90-100	90-100	70-80	30-40	10-15
	19-42	Clay	CL, SC	A-7-6, A-6	0	0	100	90-100	85-100	45-95	35-50	15-25
	42-80	Sandy clay loam, clay loam	CL-ML, SC-SM, CL, SC	A-6, A-4	0	0	100	90-100	80-100	35-80	25-40	5-20
526:												
Hetz	0-18	Clay loam	CL	A-6	0	0	100	100	90-100	70-95	30-40	5-15
	18-60	Clay loam, loam	CL	A-6	0	0	100	100	80-100	35-80	30-35	10-15
	60-80	Sandy clay loam	CL, SC	A-6	0	0	100	100	80-100	35-80	30-35	10-15
530:												
Wilmac	0-3	Loam	CL, CL-ML	A-4	0	0-10	90-100	85-100	80-90	60-80	25-30	5-10
	3-16	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	35-40	15-20
	16-38	Clay loam, clay	CL	A-7-6, A-6	0	0	---	100	90-100	70-95	35-45	15-20
	38	Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
530:												
Hosta	0-2	Loam	CL	A-6	0	0	100	95-100	85-95	60-75	25-35	10-15
	2-27	Clay loam	CL	A-6	0	0	100	95-100	90-100	70-80	35-40	15-20
	27-72	Clay loam	CL, SC	A-6	0	0	90-100	75-100	40-100	40-80	35-40	15-20
	72-80	Loam	CL	A-6	0	0	100	95-100	85-95	60-75	25-35	10-15
Millpaw	0-3	Loam	CL	A-6	0	0	100	100	85-95	60-75	25-35	10-15
	3-23	Clay loam, clay	CL	A-7	0	0	100	100	90-100	70-95	40-50	20-25
	23-80	Clay loam, loam	CL	A-6	0	0	100	90-100	85-100	60-80	30-35	10-15
531:												
Horselake	0-3	Clay loam	CL	A-6	0	0	90-100	90-100	85-100	70-80	30-35	10-15
	3-22	Clay	CH, CL	A-7-6	0	0	90-100	90-100	85-100	75-95	45-65	20-40
	22-31	Clay	CH, CL	A-7-6	0	0	90-100	90-100	85-100	75-95	40-65	15-40
	31-36	Very channery clay	CL, GC	A-6, A-2-6	0	0	30-55	30-50	30-50	20-50	30-40	10-20
	36	Weathered bedrock			---	---	---	---	---	---	---	---
Menefee	0-2	Loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	15-20
	2-8	Clay loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-80	35-45	15-20
	8	Weathered bedrock			---	---	---	---	---	---	---	---
533:												
Badland	0-80	Weathered bedrock			---	---	---	---	---	---	---	---
540:												
Ishkoten	0-6	Cobbly sandy loam	CL-ML, SC-SM, CL, SC	A-2-4, A-4	0-45	0-45	75-90	70-85	45-80	25-65	25-30	5-10
	6-22	Cobbly sandy clay, cobbly clay, clay loam	CL, SC, GC	A-7-6, A-6	0-5	0-35	75-90	70-85	60-85	35-85	35-45	15-20
	22-34	Sandy clay loam	CL, SC, CL-ML, SC-SM	A-6, A-4	0	0	95-100	90-100	80-100	35-80	25-40	5-15
	34	Weathered bedrock			---	---	---	---	---	---	---	---
Lajuita	0-3	Cobbly sandy loam	SC, SC-SM	A-2-4	0-5	0-30	75-90	70-85	45-60	25-35	25-30	5-10
	3-11	Sandy clay loam, clay loam	SC, CL, SC-SM, CL-ML	A-2-4, A-2-6, A-6, A-4	0-5	0-15	85-100	80-100	65-90	30-55	25-35	5-15
	11	Bedrock			---	---	---	---	---	---	---	---
Escrito	0-5	Sandy loam	SC-SM	A-2, A-4	0-10	0-10	95-100	90-100	65-75	30-50	20-30	5-10
	5-17	Sandy loam	CL-ML, SC-SM	A-4	0-10	0-10	95-100	90-100	65-85	45-60	25-30	5-10
	17	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
541:												
Ishkoten--------	0-6	Stony sandy clay loam	CL, SC, CL-ML, SC-SM	A-4, A-2-4	0-30	0-20	75-90	70-85	45-80	25-65	25-30	5-10
	6-13	Cobbly sandy clay, cobbly clay, clay loam	CL, GC, SC	A-7-6, A-6	0-5	0-35	75-90	70-85	60-85	35-85	35-45	15-20
	13-28	Sandy clay loam, sandy clay	CL, CL-ML, SC, SC-SM	A-6, A-4	0	0	95-100	90-100	80-100	35-80	25-40	5-15
	28	Weathered bedrock			---	---	---	---	---	---	---	---
Lajuita---------	0-3	Cobbly sandy loam	SC, SC-SM	A-2-4	0-25	0-30	75-90	70-85	45-60	25-35	25-30	5-10
	3-10	Sandy clay loam	CL, SC, CL-ML, SC-SM	A-2-4, A-2-6, A-6, A-4	0-20	0-20	90-100	90-100	65-90	30-55	25-35	5-15
	10	Bedrock			---	---	---	---	---	---	---	---
552:												
Haplustalfs-----	0-5	Very stony sandy loam	GC, CL-ML, SC-SM, SC	A-2-4, A-1-b, A-4	25-50	5-25	45-90	40-85	25-80	15-65	25-30	5-10
	5-60	Very stony sandy clay loam	GC, SC-SM, SC	A-4, A-2-6, A-1-b, A-2-4	25-50	5-25	45-90	40-85	30-75	15-45	25-35	5-15
	60-80	Very stony sandy loam, very stony loam	SC-SM, SC, GC	A-2-4, A-1-b	25-50	5-25	45-90	40-85	25-60	15-35	25-30	5-10
Argiustolls------	0-3	Very stony loam	CL-ML, SC, SC-SM	A-4, A-2-4	30-50	15-45	45-90	40-85	35-80	25-65	25-30	5-10
	3-22	Very stony clay loam	CL, SC	A-6, A-2-6	30-50	15-45	45-90	40-85	35-85	30-70	30-35	10-15
	22-43	Very stony sandy clay loam	SC, SC-SM, GC-GM, GC	A-2-4, A-1-b, A-4	30-50	15-45	45-90	40-85	30-75	15-45	25-30	5-10
	43-80	Very stony sandy clay loam	SC, GC-GM, SC-SM, GC	A-2-4, A-1-b	30-50	15-45	45-90	40-85	25-75	15-35	25-30	5-10
553:												
Haplustalfs-----	0-5	Very bouldery sandy loam	GC, GC-GM, SC-SM, SC	A-2-4, A-1-b	20-85	15-55	20-90	15-85	10-80	5-65	20-30	NP-10
	5-17	Very stony clay loam, very bouldery sandy clay	SC, GC	A-2-7, A-7-6, A-6, A-2-6	20-85	15-55	20-90	15-85	15-85	5-85	30-45	10-20
	17-80	Very stony sandy loam, very bouldery sandy clay loam	SC, SC-SM, GC, GC-GM	A-4, A-2-6, A-6, A-2-4, A-1-b	0-85	0-55	20-90	15-85	10-75	5-45	25-40	5-20

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
553:												
Ustorthents	0-3	Very bouldery sandy loam	SC-SM, GC-GM, SC, GC	A-1-b, A-2-4	25-70	20-50	45-90	40-85	25-60	15-35	25-30	5-10
	3-8	Very stony loam	SC-SM, GC, SC	A-2-4	25-70	20-50	45-90	40-85	25-60	15-35	25-30	5-10
	8	Bedrock			---	---	---	---	---	---	---	---
560:												
Herm	0-4	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	75-90	70-80	25-35	5-15
	4-11	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	100	100	75-90	70-80	25-35	5-15
	11-16	Clay, silty clay loam, clay loam	CL	A-7	0	0	100	100	85-95	80-90	40-50	20-25
	16-24	Clay, silty clay, clay loam	CL	A-7	0	0	100	100	85-95	75-85	40-50	20-25
	24-80	Clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
Dulcepeak	0-5	Very cobbly loam	CL, SC-SM, CL-ML, SC	A-4	5-45	15-45	75-90	70-80	60-80	35-65	25-30	5-10
	5-20	Clay, clay loam	CL, CH	A-6, A-7	0	0-5	100	100	90-100	75-95	40-60	20-35
	20-26	Gravelly clay loam	SC, CL, GC	A-6	0-10	0-15	60-80	55-75	50-75	40-60	30-40	10-20
	26	Unweathered bedrock			---	---	---	---	---	---	---	---
571:												
Orlie	0-2	Loam	CL	A-6	0	0	80-100	75-100	70-80	60-70	30-35	10-15
	2-22	Clay loam, silty clay loam	CL	A-6	0	0	80-100	75-100	75-95	70-85	35-40	15-20
	22-80	Clay loam, sandy clay loam, silty clay loam	CL	A-6	0	0	80-100	75-100	70-85	50-80	35-40	15-20
Cementlake	0-1	Sandy loam	SC-SM, SM, ML	A-4, A-2-4	0	0	100	95-100	60-95	30-65	25-30	NP-5
	1-17	Clay, clay loam, sandy clay	SC, CL	A-7-6, A-6	0	0	100	100	80-100	35-95	30-50	15-25
	17-32	Sandy clay loam, clay loam	CL	A-6	0	0	100	100	90-100	70-80	30-40	10-20
	32-80	Stratified sandy clay loam to sandy clay	SC, CL	A-7-6, A-6	0	0	100	100	80-95	35-70	30-45	10-20
580:												
Archmesa	0-10	Loam	CL-ML, CL	A-4	0	0-20	85-100	80-100	70-95	50-75	25-30	5-10
	10-35	Loam, clay loam	CL	A-6	0	0-20	85-100	80-100	75-100	60-80	30-35	10-15
	35	Unweathered bedrock			---	---	---	---	---	---	---	---
Skyute	0-9	Loam	CL-ML, CL		0	0-20	85-100	80-100	70-95	50-75	25-30	5-10
	9-17	Loam, clay loam	CL, CL-ML		0	0-20	85-100	80-100	70-100	50-80	25-35	5-15
	17	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
590:												
Abreu Family----	0-6	Very stony loam	CL-ML, GC-GM, SC-SM, SC	A-4, A-2-4	25-50	25-50	45-90	40-80	35-80	25-65	25-30	5-10
	6-41	Very stony clay loam	CL, SC, GC	A-6, A-2-6	25-50	25-50	45-90	40-85	35-85	30-70	30-35	10-15
	41-80	Very stony sandy clay loam	SC-SM, SC, GC, GC-GM	A-4, A-1-b, A-2-4	25-50	25-50	45-90	40-85	30-75	15-45	25-30	5-10
Rubbleland------	---	---	---	---	---	---	---	---	---	---	---	---
Rock Outcrop----	0-80	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
600:												
Haplustepts-----	0-5	Very stony loam	CL-ML, SC-SM, SC	A-4, A-2-4	10-45	0-45	75-90	70-85	50-80	30-65	25-30	5-10
	5-43	Very stony loam, very stony fine sandy loam	CL-ML, SC, SC-SM	A-4, A-2-4	10-45	0-45	75-90	70-85	50-80	30-65	25-30	5-10
	43	Bedrock			---	---	---	---	---	---	---	---
Haplustalfs-----	0-4	Very stony sandy loam	SC-SM	A-2-4	45-55	10-25	85-95	50-60	35-50	20-30	25-30	5-10
	4-14	Very stony sandy clay	SC	A-6	45-55	10-25	85-95	80-95	70-90	35-60	35-40	15-20
	14-80	Very stony sandy clay loam	SC	A-4, A-2-4	45-55	10-25	85-95	80-90	65-85	30-55	25-30	5-10

Table 17.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
5:												
Water	---	---	---	---	---	---	---	---	---	--	---	---
6:												
Miscellaneous Water	---	---	---	---	---	---	---	---	---	--	---	---
10:												
Elias	0-1	5-10	1.35-1.50	0.2-2	0.14-0.16	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	1-10	27-35	1.25-1.40	0.06-0.2	0.18-0.20	3.0-5.9	0.5-1.0	.24	.24			
	10-36	5-15	1.35-1.50	2-6	0.13-0.16	0.0-2.9	0.0-0.5	.37	.37			
	36-80	5-15	1.25-1.50	2-6	0.09-0.17	0.0-2.9	0.0-0.5	.32	.32			
Canyada	0-1	40-58	1.05-1.15	0.06-0.2	0.14-0.17	6.0-8.9	0.5-2.0	.20	.20	5	4	86
	1-16	38-58	1.15-1.40	0.06-0.2	0.14-0.21	6.0-8.9	0.5-1.0	.24	.24			
	16-41	10-18	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
	41-80	5-10	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-0.5	.28	.28			
Sparank	0-3	27-35	1.15-1.40	0.2-0.6	0.17-0.21	3.0-6.0	0.5-1.5	.32	.32	5	4L	86
	3-14	40-45	1.15-1.30	0.06-0.2	0.14-0.17	6.0-8.9	0.5-1.5	.24	.24			
	14-44	35-40	1.15-1.40	0.06-0.2	0.17-0.21	3.0-6.0	0.5-1.5	.32	.32			
	44-60	40-45	1.15-1.30	0.06-0.2	0.14-0.17	6.0-9.0	0.5-1.5	.24	.24			
	60-80	30-35	1.25-1.40	0.2-0.6	0.14-0.18	3.0-6.0	0.5-1.5	.20	.20			
13:												
Doakum	0-4	5-15	1.35-1.50	2-6	0.14-0.17	0.0-3.0	0.5-1.0	.32	.32	5	3	86
	4-12	25-35	1.25-1.40	0.2-2	0.14-0.21	3.0-6.0	0.5-1.0	.24	.24			
	12-53	15-25	1.25-1.50	0.6-6	0.13-0.18	0.0-3.0	0.0-0.5	.32	.32			
	53-80	5-15	1.35-1.50	2-20	0.10-0.17	0.0-3.0	0.0-0.5	.37	.37			
Betonnie	0-4	5-10	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.5-0.6	.28	.28	5	3	86
	4-17	5-18	1.45-1.55	2-6	0.09-0.15	0.0-2.9	0.4-0.5	.28	.28			
	17-50	10-15	1.45-1.55	2-6	0.09-0.15	0.0-2.9	0.1-0.3	.28	.28			
	50-80	2-15	1.35-1.60	2-20	0.08-0.15	0.0-2.9	0.0-0.3	.32	.32			
18:												
Sparham	0-2	40-55	1.35-1.45	0.0000-0.06	0.13-0.15	6.0-8.9	0.8-0.9	.20	.24	5	4	86
	2-80	35-55	1.35-1.45	0.0000-0.06	0.18-0.20	6.0-8.9	0.1-0.3	.32	.37			
19:												
Sparham	0-9	20-27	1.40-1.50	0.6-2	0.18-0.20	0.0-2.9	0.8-0.9	.43	.49	5	6	48
	9-80	35-55	1.35-1.45	0.0000-0.06	0.18-0.20	6.0-8.9	0.1-0.3	.32	.37			
20:												
Menefee	0-3	27-35	1.25-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	3-9	27-35	1.25-1.30	0.06-0.2	0.18-0.20	3.0-5.9	0.0-1.0	.32	.32			
	9-21	---	---	0.0000-0.2	---	---	---	---	---			
Vessilla	0-1	5-10	1.45-1.55	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.24	.24	1	3	86
	1-9	5-10	1.45-1.55	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.24	.24			
	9-19	---	---	0.0000-2	---	---	---	---	---			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
20:												
Rock Outcrop	0-80	---	---	---	---	---	---	---	---	--	8	---
21:												
Badland	0-80	---	---	0.0000-0.2	0.00-0.00	---	---	---	---	--	8	0
Menefee	0-2	27-35	1.25-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	2-8	27-35	1.25-1.30	0.06-0.2	0.18-0.20	3.0-5.9	0.0-1.0	.32	.32			
	8-18	---	---	0.0000-0.2	---	---	---	---	---			
Rock Outcrop	0-80	---	---	---	---	---	---	---	---	--	8	---
23:												
Teromote	0-19	27-35	1.15-1.30	0.2-0.6	0.17-0.21	3.0-5.9	0.5-2.0	.32	.32	5	4L	86
	19-40	15-30	1.15-1.50	0.2-0.6	0.13-0.21	0.0-5.9	0.5-1.0	.32	.32			
	40-80	27-35	1.25-1.40	0.2-0.6	0.17-0.21	3.0-5.9	0.5-1.0	.24	.24			
24:												
Orlie	0-2	15-20	1.15-1.25	0.2-0.6	0.11-0.14	0.0-2.9	2.0-3.0	.28	.28	5	3	86
	2-25	28-35	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.7-0.9	.37	.37			
	25-80	28-35	1.40-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.1-0.3	.37	.37			
Sparham	0-3	40-55	1.35-1.45	0.0000-0.06	0.13-0.15	6.0-8.9	0.8-0.9	.20	.24	5	4	86
	3-80	35-55	1.35-1.45	0.0000-0.06	0.18-0.20	6.0-8.9	0.1-0.3	.32	.37			
32:												
Doakum	0-4	5-15	1.35-1.50	2-6	0.14-0.17	0.0-3.0	0.5-1.0	.32	.32	5	3	86
	4-12	25-35	1.25-1.40	0.2-2	0.14-0.21	3.0-6.0	0.5-1.0	.24	.24			
	12-53	15-25	1.25-1.50	0.6-6	0.13-0.18	0.0-3.0	0.0-0.5	.32	.32			
	53-80	5-15	1.35-1.50	2-20	0.10-0.17	0.0-3.0	0.0-0.5	.37	.37			
40:												
Parkelei	0-2	15-20	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	2-38	20-35	1.40-1.50	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.32	.32			
	38-80	15-25	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
Menefee	0-3	27-35	1.25-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	3-9	27-35	1.25-1.30	0.06-0.2	0.18-0.20	3.0-5.9	0.0-1.0	.32	.32			
	9-19	---	---	0.0000-0.2	---	---	---	---	---			
Vessilla	0-3	5-10	1.45-1.55	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.24	.24	2	3	86
	3-17	5-10	1.45-1.55	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.24	.24			
	17-27	---	---	0.0000-2	---	---	---	---	---			
64:												
Dula	0-11	18-25	1.08-1.12	0.6-2	0.16-0.18	0.0-2.9	2.0-3.0	.37	.37	3	6	48
	11-28	18-25	1.08-1.12	0.6-2	0.16-0.18	0.0-2.9	1.0-3.0	.37	.37			
	28-80	1-10	1.65-1.80	20-20	0.01-0.02	0.0-2.9	0.0-0.5	.05	.32			
69:												
Pinavetes	0-2	3-10	1.45-1.60	6-20	0.06-0.08	0.0-2.9	0.0-1.0	.20	.20	5	2	134
	2-80	3-10	1.45-1.60	6-20	0.05-0.08	0.0-2.9	0.0-0.5	.24	.24			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
69:												
Florita	0-31	10-15	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	31-41	5-10	1.40-1.50	2-6	0.10-0.12	0.0-2.9	0.0-0.5	.28	.28			
	41-80	10-15	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.32	.32			
70:												
Blancot	0-7	10-20	1.25-1.40	0.6-2	0.14-0.18	0.0-2.9	0.5-0.7	.37	.37	5	4	86
	7-26	27-35	1.25-1.40	0.2-0.6	0.17-0.21	3.0-5.9	0.5-1.0	.24	.24			
	26-80	15-30	1.25-1.40	0.2-0.6	0.17-0.21	3.0-5.9	0.1-0.5	.32	.32			
Councelor	0-2	5-15	1.35-1.50	2-6	0.13-0.15	0.0-2.9	0.3-1.0	.28	.28	5	3	86
	2-32	5-18	1.35-1.50	2-6	0.10-0.15	0.0-2.9	0.1-0.5	.28	.28			
	32-60	5-10	1.45-1.60	6-20	0.08-0.11	0.0-2.9	0.0-0.5	.32	.32			
	60-80	20-30	1.25-1.40	0.6-2	0.14-0.18	2.9-5.9	0.0-0.5	.24	.24			
Tsosie	0-2	28-35	1.45-1.55	0.2-0.6	0.15-0.18	3.0-5.9	0.5-0.9	.32	.32	5	4L	86
	2-36	18-35	1.45-1.55	0.2-0.6	0.14-0.17	3.0-5.9	0.1-0.3	.37	.37			
	36-80	18-35	1.30-1.45	0.6-2	0.10-0.15	3.0-5.9	0.1-0.3	.32	.43			
104:												
Doakum	0-3	10-20	1.45-1.55	0.6-2	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	3-33	25-35	1.35-1.45	0.2-0.6	0.16-0.20	3.0-5.9	0.5-1.0	.32	.32			
	33-55	10-20	1.45-1.55	0.6-2	0.09-0.18	0.0-2.9	0.0-0.5	.28	.28			
	55-80	5-15	1.45-1.55	0.6-6	0.09-0.16	0.0-2.9	0.0-0.5	.28	.28			
Oro	0-2	27-35	1.25-1.40	0.2-2	0.14-0.21	3.0-6.0	0.5-1.0	.32	.32	5	6	48
	2-25	40-50	1.15-1.40	0.06-0.2	0.14-0.21	6.0-9.0	0.0-0.5	.28	.28			
	25-39	10-15	1.35-1.50	2-6	0.13-0.15	0.0-3.0	0.0-0.5	---	---			
	39-80	5-15	1.35-1.60	2-20	0.08-0.15	0.0-3.0	0.0-0.2	.32	.32			
105:												
Badland	0-80	---	---	---	---	---	---	---	---	--	8	0
Menefee	0-4	20-25	1.05-1.15	0.6-2	0.16-0.18	0.0-2.9	2.0-3.0	.37	.37	1	4L	86
	4-10	30-35	1.25-1.35	0.06-0.2	0.19-0.21	3.0-5.9	0.0-1.0	.32	.32			
	10-14	---	---	0.0000-0.2	---	---	---	---	---			
107:												
Berryman	0-3	18-26	1.15-1.25	0.6-2	0.19-0.21	0.0-2.9	1.0-2.0	.43	.43	5	4L	86
	3-80	18-35	1.45-1.55	0.06-0.2	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37			
Ruson	0-2	20-26	1.00-1.15	0.6-2	0.19-0.21	0.0-2.9	1.0-2.0	.43	.49	5	4L	86
	2-19	35-40	1.40-1.50	0.2-0.6	0.17-0.19	3.0-5.9	0.0-0.5	.37	.37			
	19-80	40-50	1.40-1.50	0.06-0.2	0.13-0.15	6.0-8.9	0.0-0.5	.24	.28			
108:												
Peney	0-3	18-26	1.15-1.25	0.6-2	0.11-0.13	0.0-2.9	1.0-2.0	.20	.37	1	5	56
	3-10	18-35	1.20-1.30	0.2-0.6	0.15-0.17	3.0-5.9	0.0-1.0	.43	.43			
	10-14	---	---	0.0000-0.06	---	---	---	---	---			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
108:												
Ransect	0-3	28-35	1.25-1.40	0.2-0.6	0.19-0.20	3.0-5.9	1.0-2.0	.37	.37	2	4L	86
	3-38	28-35	1.30-1.45	0.2-0.6	0.19-0.20	3.0-5.9	0.0-0.8	.37	.37			
	38-42	---	---	0.0000-0.06	---	---	---	---	---			
115:												
Menefee	0-2	20-30	1.25-1.35	0.2-0.6	0.16-0.20	0.0-2.9	2.0-3.0	.20	.37	2	4L	86
	2-11	30-35	1.25-1.35	0.06-0.2	0.19-0.21	3.0-5.9	0.0-1.0	.32	.32			
	11-15	---	---	0.0000-0.2	---	---	---	---	---			
119:												
Roques	0-2	35-40	1.35-1.45	0.2-0.6	0.19-0.21	3.0-5.9	1.0-2.0	.32	.32	5	4	86
	2-80	40-55	1.20-1.35	0.0000-0.06	0.14-0.16	6.0-8.9	0.0-0.5	.20	.20			
Nusmag	0-2	32-40	1.15-1.30	0.2-0.6	0.19-0.21	3.0-5.9	2.0-3.0	.32	.32	5	4	86
	2-18	40-55	1.20-1.30	0.0000-0.06	0.14-0.16	6.0-8.9	0.5-1.0	.20	.20			
	18-80	40-55	1.20-1.30	0.0000-0.06	0.14-0.16	6.0-8.9	0.0-0.5	.17	.17			
136:												
Elpedro	0-3	15-22	1.15-1.25	0.6-2	0.19-0.21	0.0-2.9	0.5-0.9	.43	.43	5	5	56
	3-80	20-35	1.40-1.50	0.6-2	0.17-0.19	0.0-2.9	0.0-0.5	.43	.43			
155:												
Vessilla	0-1	10-20	1.45-1.55	2-6	0.11-0.13	0.0-2.9	0.6-0.9	.24	.24	1	3	86
	1-15	8-18	1.50-1.60	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	15-19	---	---	0.2-2	---	---	---	---	---			
Menefee	0-3	30-35	1.25-1.35	0.2-0.6	0.19-0.21	3.0-5.9	2.0-3.0	.32	.32	1	4L	86
	3-10	30-35	1.25-1.35	0.06-0.2	0.19-0.21	3.0-5.9	0.0-1.0	.32	.32			
	10-14	---	---	0.0000-0.2	---	---	---	---	---			
Orlie	0-4	10-20	1.20-1.40	2-6	0.09-0.11	0.0-2.9	2.0-3.0	.28	.28	5	3	86
	4-32	20-35	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.0-1.0	.32	.32			
	32-80	20-35	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.5	.32	.32			
156:												
Lindrith	0-7	20-27	1.35-1.45	0.6-2	0.16-0.18	3.0-5.9	0.8-2.0	.37	.37	5	5	56
	7-60	10-18	1.45-1.55	0.6-2	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	60-80	5-10	1.55-1.65	6-20	0.06-0.08	0.0-2.9	0.0-0.5	.17	.17			
Royosa	0-2	3-10	1.35-1.45	20-20	0.06-0.08	0.0-2.9	1.0-2.0	.17	.17	5	2	134
	2-80	3-10	1.35-1.50	20-20	0.06-0.08	0.0-2.9	1.0-2.0	.17	.17			
214:												
Quimera	0-3	30-40	1.20-1.30	0.2-0.6	0.09-0.11	3.0-5.9	0.5-0.9	.10	.32	1	6	48
	3-15	35-40	1.30-1.40	0.2-0.6	0.19-0.21	3.0-5.9	0.0-0.5	.32	.32			
	15-17	40-50	1.25-1.35	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.20	.20			
	17-21	---	---	0.0000-0.06	---	---	---	---	---			
Ishkoten	0-3	15-22	1.25-1.50	0.6-6	0.07-0.13	0.0-3.0	1.0-3.0	.24	.28	1	6	48
	3-17	35-45	1.15-1.40	0.06-0.2	0.10-0.13	3.0-6.0	0.0-0.8	.10	.17			
	17-24	20-38	1.25-1.40	0.06-2	0.14-0.21	0.0-6.0	0.0-0.5	.24	.24			
	24-34	---	---	0.0000-0.2	---	---	---	---	---			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
220:												
Skyvillage	0-4	10-15	1.45-1.55	2-6	0.09-0.11	0.0-2.9	0.5-2.0	.24	.24	1	3	86
	4-16	10-15	1.45-1.55	2-6	0.09-0.11	0.0-2.9	0.5-2.0	.24	.24			
	16-26	---	---	0.2-2	---	---	---	---	---			
Eslendo	0-13	27-37	1.35-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-0.5	.37	.37	2	4L	86
	13-23	---	---	0.0000-0.2	---	---	---	---	---			
Rock Outcrop	0-80	---	---	---	---	---	---	---	---	--	8	0
229:												
Nusmag	0-2	32-40	1.15-1.30	0.2-0.6	0.19-0.21	3.0-5.9	2.0-3.0	.32	.32	5	4	86
	2-18	40-55	1.20-1.30	0.0000-0.06	0.14-0.16	6.0-8.9	0.5-1.0	.20	.20			
	18-80	40-55	1.20-1.30	0.0000-0.06	0.14-0.16	6.0-8.9	0.0-0.5	.17	.17			
Tottles	0-6	30-35	1.15-1.25	0.2-0.6	0.19-0.21	3.0-5.9	2.0-3.0	.32	.32	5	4L	86
	6-21	40-45	1.40-1.50	0.06-0.2	0.14-0.16	3.0-5.9	1.0-2.0	.20	.20			
	21-80	40-55	1.35-1.50	0.06-0.2	0.14-0.16	6.0-8.9	0.7-0.9	.20	.20			
231:												
Sparham	0-2	35-40	1.45-1.55	0.2-0.6	0.08-0.10	3.0-5.9	0.8-0.9	.32	.37	5	4	86
	2-35	35-55	1.35-1.45	0.0000-0.06	0.08-0.10	6.0-8.9	0.0-0.5	.28	.32			
	35-80	40-55	1.35-1.45	0.0000-0.06	0.08-0.10	6.0-8.9	0.0-0.5	.20	.24			
303:												
Orlie	0-2	20-27	1.10-1.20	0.6-2	0.16-0.18	0.0-2.9	2.0-3.0	.37	.37	5	6	48
	2-22	28-35	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.7-0.9	.37	.37			
	22-80	28-35	1.40-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.1-0.3	.37	.37			
304:												
Orlie	0-4	20-27	1.10-1.20	0.6-2	0.16-0.18	0.0-2.9	2.0-3.0	.37	.37	5	6	48
	4-26	28-35	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.7-0.9	.37	.37			
	26-80	28-35	1.40-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.5	.37	.37			
Nalivag	0-3	20-27	1.25-1.40	0.2-0.6	0.17-0.21	3.0-5.9	1.0-3.0	.28	.28	5	6	48
	3-10	20-35	1.25-1.40	0.2-2	0.14-0.18	3.0-5.9	0.5-1.0	.20	.20			
	10-39	22-32	1.15-1.40	0.2-2	0.14-0.21	3.0-5.9	0.0-1.0	.37	.37			
	39-80	27-35	1.25-1.40	0.2-0.6	0.17-0.21	3.0-5.9	0.0-1.0	.24	.24			
310:												
Rock Outcrop	0-80	---	---	---	---	---	---	---	---	--	8	0
Vessilla	0-12	5-10	1.45-1.55	2-6	0.09-0.11	0.0-2.9	0.5-1.0	.24	.24	1	3	86
	12-22	---	---	0.2-2	---	---	---	---	---			
Menefee	0-2	20-30	1.25-1.30	0.6-2	0.14-0.16	3.0-5.9	1.0-2.0	.37	.37	1	4L	86
	2-6	27-35	1.25-1.30	0.06-0.2	0.18-0.20	3.0-5.9	0.0-1.0	.32	.32			
	6-16	---	---	0.0000-0.2	---	---	---	---	---			
340:												
Riverwash	0-6	0-1	---	6-20	0.03-0.04	0.0-2.9	0.0-0.1	---	---	--	1	180
	6-80	0-5	---	6-20	0.04-0.06	0.0-2.9	---	---	---			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
340:												
Kwakina	0-2	3-10	1.55-1.65	20-20	0.06-0.08	0.0-2.9	0.0-0.5	.24	.24	5	2	134
	2-80	5-10	1.55-1.65	20-20	0.06-0.08	0.0-2.9	0.0-0.5	.24	.24			
Tapicito	0-3	5-15	1.35-1.50	2-6	0.14-0.17	0.0-2.9	0.0-1.0	.32	.32	5	3	86
	3-39	5-18	1.35-1.50	2-6	0.13-0.17	0.0-2.9	0.0-1.0	.37	.37			
	39-80	5-10	1.45-1.60	6-20	0.06-0.11	0.0-2.9	0.0-1.0	.32	.32			
350:												
Hosta	0-2	20-30	1.20-1.40	0.6-2	0.14-0.16	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	2-27	35-45	1.30-1.50	0.06-0.2	0.18-0.20	3.0-5.9	1.0-3.0	.32	.32			
	27-80	20-35	1.20-1.40	0.2-2	0.14-0.21	3.0-5.9	0.0-0.5	.32	.32			
370:												
Orlie	0-3	10-20	1.20-1.40	2-6	0.09-0.11	0.0-2.9	2.0-3.0	.28	.28	5	3	86
	3-18	20-35	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.0-1.0	.32	.32			
	18-80	18-35	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.5	.32	.32			
380:												
Teequee	0-2	20-35	1.25-1.40	0.2-2	0.10-0.16	3.0-6.0	1.0-2.0	.15	.28	4	7	38
	2-51	40-55	1.15-1.30	0.06-0.2	0.14-0.16	6.0-9.0	0.0-0.5	.17	.17			
	51-61	---	---	0.0000-0.2	---	---	---	---	---			
Menefee	0-2	30-35	1.25-1.35	0.2-0.6	0.19-0.21	3.0-5.9	2.0-3.0	.32	.32	1	4L	86
	2-10	30-35	1.25-1.35	0.06-0.2	0.19-0.21	3.0-5.9	0.0-1.0	.32	.32			
	10-14	---	---	0.0000-0.2	---	---	---	---	---			
Vessilla	0-2	10-20	1.45-1.55	2-6	0.14-0.16	0.0-2.9	0.6-0.9	.28	.28	1	3	86
	2-10	8-18	1.50-1.60	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	10-14	---	---	0.2-2	---	---	---	---	---			
390:												
Losindios	0-2	10-20	1.35-1.50	0.6-6	0.09-0.12	0.0-3.0	1.0-3.0	.24	.24	5	3	86
	2-37	20-35	1.25-1.40	0.2-2	0.14-0.18	3.0-6.0	0.0-0.5	.24	.24			
	37-80	10-24	1.25-1.50	0.6-6	0.09-0.16	0.0-6.0	0.0-0.5	.32	.32			
Escrito	0-4	10-20	1.40-1.50	2-6	0.11-0.13	0.0-2.9	0.5-0.9	.24	.28	1	3	86
	4-16	15-25	1.35-1.50	2-6	0.12-0.17	0.0-2.9	0.0-0.5	.24	.28			
	16-26	---	---	0.2-2	---	---	---	---	---			
Parkelei	0-2	15-20	1.45-1.55	2-6	0.13-0.15	0.0-2.9	0.5-1.0	.28	.28	5	3	86
	2-38	20-35	1.40-1.50	0.6-2	0.17-0.19	3.0-5.9	0.0-0.5	.32	.32			
	38-80	15-25	1.40-1.50	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
403:												
Vosburg	0-3	15-20	1.45-1.55	2-6	0.13-0.15	0.0-2.9	1.0-3.0	.24	.24	5	4	86
	3-25	27-35	1.35-1.45	0.2-0.6	0.18-0.20	3.0-5.9	2.0-3.0	.32	.32			
	25-35	25-35	1.35-1.45	0.2-0.6	0.18-0.19	3.0-5.9	1.0-2.0	.32	.32			
	35-80	25-35	1.35-1.45	0.2-0.6	0.18-0.19	3.0-5.9	1.0-2.0	.32	.32			
Millpaw	0-3	18-27	1.20-1.35	0.6-2	0.14-0.16	3.0-5.9	1.0-3.0	.24	.24	5	6	48
	3-23	35-45	1.20-1.40	0.01-0.6	0.14-0.20	6.0-8.9	1.0-3.0	.20	.20			
	23-80	25-35	1.25-1.40	0.01-0.6	0.14-0.20	3.0-5.9	0.0-0.5	.37	.37			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
421:												
Argiustolls	0-23	15-25	1.25-1.40	0.6-2	0.07-0.09	0.0-3.0	1.0-2.0	.10	.28	2	8	0
	23-40	35-45	1.15-1.30	0.06-0.2	0.07-0.08	3.0-6.0	0.5-1.0	.05	.17			
	40-80	28-40	1.25-1.40	0.2-2	0.17-0.21	3.0-6.0	0.0-0.5	.28	.28			
Ustorthents	0-4	10-20	1.35-1.50	0.6-6	0.07-0.10	0.0-3.0	0.5-1.0	.15	.28	2	3	86
	4-16	20-28	1.25-1.50	0.6-6	0.07-0.13	0.0-6.0	0.5-1.0	.24	.43			
	16-32	10-20	1.35-1.50	0.6-6	0.05-0.07	0.0-6.0	0.0-1.0	.10	.28			
	32-42	---	---	0.2-2	---	---	---	---	---			
Rock Outcrop	0-80	---	---	---	---	---	---	---	---	--	8	0
430:												
Wilmac, dry	0-3	18-27	1.25-1.40	0.2-2	0.14-0.18	1.0-3.0	1.0-3.0	.37	.37	3	6	48
	3-11	35-45	1.25-1.40	0.06-0.2	0.17-0.21	3.0-6.0	0.0-0.5	.28	.28			
	11-26	35-45	1.25-1.40	0.06-0.2	0.13-0.19	3.0-6.0	0.0-0.5	.28	.28			
	26-36	---	---	0.0000-0.2	---	---	---	---	---			
Hosta	0-4	20-35	1.25-1.40	0.2-2	0.14-0.21	0.0-3.0	0.5-1.0	.37	.37	5	6	48
	4-17	35-45	1.15-1.40	0.06-0.2	0.14-0.21	3.0-6.0	0.0-0.5	.28	.28			
	17-80	27-45	1.15-1.40	0.06-0.6	0.14-0.21	3.0-6.0	0.0-0.5	.28	.28			
440:												
Losindios	0-2	10-20	1.35-1.50	0.6-6	0.09-0.12	0.0-3.0	1.0-3.0	.24	.24	5	3	86
	2-37	20-35	1.25-1.40	0.2-2	0.14-0.18	3.0-6.0	0.0-0.5	.24	.24			
	37-80	10-24	1.25-1.50	0.6-6	0.09-0.16	0.0-6.0	0.0-0.5	.32	.32			
Jaythree	0-2	10-20	1.25-1.50	0.6-6	0.10-0.18	0.0-3.0	1.0-5.0	.28	.28	5	3	86
	2-24	20-35	1.25-1.40	0.2-2	0.14-0.18	3.0-6.0	0.5-3.0	.17	.17			
	24-80	10-25	1.25-1.50	0.6-6	0.10-0.18	0.0-6.0	0.0-0.5	.32	.32			
452:												
Gojiya	0-50	40-50	1.15-1.30	0.06-0.2	0.14-0.17	6.0-9.0	0.5-1.0	.24	.24	5	4	86
	50-80	28-60	1.15-1.30	0.06-0.6	0.14-0.21	6.0-9.0	0.5-1.0	.32	.32			
500:												
Escrito	0-6	10-18	1.35-1.45	0.6-6	0.12-0.16	0.0-2.9	1.0-3.0	.28	.28	1	3	86
	6-16	10-18	1.35-1.50	0.6-6	0.12-0.17	0.0-2.9	0.0-0.5	.37	.37			
	16-26	---	---	0.2-2	---	---	---	---	---			
Rock Outcrop	0-80	---	---	---	---	---	---	---	---	--	8	0
Dulcepeak	0-12	10-15	1.45-1.55	0.6-2	0.13-0.15	0.0-2.9	1.0-5.0	.28	.28	3	3	86
	12-25	35-55	1.15-1.30	0.06-0.2	0.14-0.16	6.0-9.0	0.0-0.5	.17	.17			
	25-35	---	---	0.2-2	---	---	---	---	---			
501:												
Zau	0-13	16-25	0.99-1.12	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.28	.28	3	6	48
	13-16	16-25	1.20-1.25	0.6-2	0.16-0.18	2.9-5.9	0.3-0.9	.24	.24			
	16-21	40-50	1.37-1.43	0.06-0.2	0.14-0.16	6.0-8.9	0.1-0.5	.24	.24			
	21-48	---	---	0.2-0.6	---	---	---	---	---			
Lomapedro	0-20	10-25	1.10-1.30	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.28	.28	4	5	56
	20-26	27-40	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.3-1.0	.32	.32			
	26-37	38-50	1.10-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.3-0.9	.24	.24			
	37-52	38-50	1.10-1.30	0.06-0.2	0.14-0.16	6.0-8.9	0.1-0.5	.24	.24			
	52-62	---	---	0.0000-0.2	---	---	---	---	---			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
515:												
Ustorthents	0-28	10-20	1.25-1.35	0.6-6	0.05-0.07	0.0-3.0	0.0-1.0	.10	.28	3	8	0
	28-38	---	---	0.0000-0.2	---	---	---	---	---			
Rock Outcrop	0-80	---	---	---	---	---	---	---	---	--	8	0
523:												
Suposo	0-3	10-27	1.35-1.45	0.6-2	0.14-0.16	3.0-5.9	3.0-6.0	.37	.37	5	6	48
	3-11	27-35	1.35-1.45	0.6-2	0.14-0.16	3.0-5.9	2.0-5.0	.37	.37			
	11-50	40-55	1.25-1.35	0.06-0.2	0.14-0.15	6.0-8.9	2.0-5.0	.20	.20			
	50-80	35-55	1.25-1.45	0.06-0.6	0.14-0.15	6.0-8.9	0.5-2.0	.32	.32			
Ohwiler	0-7	15-25	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	3.0-5.0	.37	.37	5	6	48
	7-22	15-25	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	1.0-4.0	.37	.37			
	22-62	28-35	1.25-1.35	0.2-0.6	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
	62-80	20-35	1.25-1.35	0.2-0.6	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
524:												
Jicarilla	0-3	28-35	1.25-1.40	0.2-0.6	0.17-0.21	3.0-6.0	1.0-4.0	.20	.20	5	6	48
	3-32	35-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-9.0	1.0-4.0	.20	.20			
	32-42	30-45	1.15-1.40	0.06-0.2	0.14-0.21	6.0-9.0	0.5-2.0	.24	.24			
	42-80	25-45	1.15-1.40	0.06-2	0.14-0.18	3.0-6.0	0.5-1.0	.20	.20			
Ohwiler	0-7	15-25	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	3.0-5.0	.37	.37	5	6	48
	7-22	15-25	1.25-1.35	0.6-2	0.14-0.16	3.0-5.9	1.0-4.0	.37	.37			
	22-62	28-35	1.25-1.35	0.2-0.6	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
	62-80	20-35	1.25-1.35	0.2-0.6	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
525:												
Jaythree	0-2	10-20	1.25-1.50	0.6-6	0.10-0.18	0.0-3.0	1.0-5.0	.28	.28	5	3	86
	2-24	20-35	1.25-1.40	0.2-2	0.14-0.18	3.0-6.0	0.5-3.0	.17	.17			
	24-80	10-25	1.25-1.50	0.6-6	0.10-0.18	0.0-6.0	0.0-0.5	.32	.32			
Cedarsprings	0-9	15-26	1.25-1.40	0.6-2	0.14-0.18	0.0-3.0	1.0-5.0	.24	.24	5	6	48
	9-19	27-39	1.15-1.40	0.06-0.2	0.17-0.21	3.0-6.0	0.5-5.0	.17	.17			
	19-42	35-50	1.15-1.40	0.06-0.2	0.13-0.17	6.0-9.0	0.5-5.0	.17	.17			
	42-80	20-40	1.25-1.40	0.06-2	0.14-0.21	3.0-9.0	0.0-0.5	.28	.28			
526:												
Hetz	0-18	25-35	1.15-1.40	0.2-0.6	0.17-0.21	3.0-6.0	---	.28	.28	5	4L	86
	18-60	25-35	1.25-1.40	0.2-0.6	0.14-0.21	3.0-6.0	---	.24	.24			
	60-80	28-35	1.25-1.40	0.2-0.6	0.14-0.21	3.0-6.0	---	.28	.28			
530:												
Wilmac	0-3	18-27	1.25-1.40	0.2-2	0.14-0.18	1.0-3.0	1.0-3.0	.24	.28	3	6	48
	3-16	35-45	1.25-1.40	0.06-0.2	0.17-0.21	3.0-6.0	0.0-0.5	.28	.28			
	16-38	35-45	1.15-1.40	0.06-0.2	0.14-0.21	3.0-6.0	0.0-0.5	.28	.28			
	38-48	---	---	0.0000-0.2	---	---	---	---	---			
Hosta	0-2	18-27	1.20-1.40	0.6-2	0.14-0.16	3.0-5.9	1.0-3.0	.37	.37	5	6	48
	2-27	30-35	1.30-1.50	0.06-0.2	0.18-0.20	3.0-5.9	1.0-3.0	.32	.32			
	27-72	30-35	1.30-1.50	0.06-0.2	0.16-0.20	3.0-5.9	0.0-0.5	.15	.15			
	72-80	18-27	1.20-1.40	0.6-2	0.14-0.16	3.0-5.9	0.0-0.5	.32	.32			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
530:												
Millpaw	0-3	18-27	1.20-1.35	0.6-2	0.14-0.16	3.0-5.9	1.0-3.0	.24	.24	5	6	48
	3-23	35-45	1.20-1.40	0.01-0.6	0.14-0.20	6.0-8.9	1.0-3.0	.20	.20			
	23-80	25-35	1.25-1.40	0.01-0.6	0.14-0.20	3.0-5.9	0.0-0.5	.37	.37			
531:												
Horselake	0-3	28-35	1.25-1.40	0.2-0.6	0.17-0.21	3.0-6.0	0.5-2.0	.24	.24	3	6	48
	3-22	45-60	1.15-1.30	0.06-0.2	0.14-0.16	6.0-9.0	0.0-0.5	.17	.17			
	22-31	40-60	1.15-1.30	0.06-0.2	0.14-0.16	6.0-9.0	0.0-0.5	.17	.17			
	31-36	28-40	1.15-1.40	0.06-0.6	0.07-0.11	3.0-6.0	0.0-0.2	.10	.28			
	36-46	---	---	0.0000-0.2	---	---	---	---	---			
Menefee	0-2	22-27	1.25-1.30	0.2-0.6	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32	2	4L	86
	2-8	27-35	1.25-1.30	0.06-0.2	0.18-0.20	3.0-5.9	0.0-1.0	.32	.32			
	8-22	---	---	0.0000-0.2	---	---	---	---	---			
533:												
Badland	0-80	---	---	---	---	---	---	---	---	--	8	0
540:												
Ishkoten	0-6	15-22	1.25-1.50	0.6-6	0.07-0.13	0.0-3.0	1.0-3.0	.15	.24	3	3	86
	6-22	35-45	1.15-1.40	0.06-0.2	0.10-0.13	3.0-6.0	0.0-0.8	.10	.17			
	22-34	20-38	1.25-1.40	0.06-2	0.14-0.21	0.0-6.0	0.0-0.5	.24	.24			
	34-44	---	---	0.0000-0.6	---	---	---	---	---			
Lajuita	0-3	12-18	1.35-1.50	2-6	0.07-0.10	0.0-3.0	1.0-3.0	.17	.32	1	3	86
	3-11	20-34	1.25-1.40	0.2-2	0.13-0.16	3.0-6.0	0.0-0.5	.24	.24			
	11-21	---	---	0.2-2	---	---	---	---	---			
Escrito	0-5	10-20	1.40-1.50	2-6	0.11-0.13	0.0-2.9	0.5-0.9	.24	.28	1	3	86
	5-17	10-25	1.35-1.50	2-6	0.12-0.17	0.0-2.9	0.0-0.5	.24	.28			
	17-27	---	---	0.2-2	---	---	---	---	---			
541:												
Ishkoten	0-6	15-22	1.25-1.50	0.6-6	0.07-0.13	0.0-3.0	1.0-3.0	.15	.24	3	3	86
	6-13	35-45	1.15-1.40	0.06-0.2	0.10-0.13	3.0-6.0	0.0-0.8	.10	.17			
	13-28	20-38	1.25-1.40	0.06-2	0.14-0.21	0.0-6.0	0.0-0.5	.24	.24			
	28-38	---	---	0.0000-0.6	---	---	---	---	---			
Lajuita	0-3	12-18	1.35-1.50	2-6	0.07-0.10	0.0-3.0	1.0-3.0	.17	.32	1	3	86
	3-10	20-34	1.25-1.40	0.2-2	0.13-0.16	3.0-6.0	0.0-0.5	.24	.24			
	10-20	---	---	0.2-2	---	---	---	---	---			
552:												
Haplustalfs	0-5	10-20	1.25-1.50	0.6-6	0.05-0.09	0.0-3.0	1.0-3.0	.10	.28	4	8	0
	5-60	20-35	1.25-1.40	0.2-2	0.07-0.09	0.0-3.0	0.0-0.5	.10	.24			
	60-80	10-20	1.35-1.50	0.6-6	0.05-0.07	0.0-3.0	0.0-0.5	.10	.32			
Argiustolls	0-3	10-25	1.25-1.40	0.6-6	0.07-0.09	0.0-3.0	1.0-3.0	.10	.28	4	8	0
	3-22	28-35	1.25-1.40	0.2-0.6	0.09-0.11	0.0-3.0	0.0-0.5	.10	.28			
	22-43	20-30	1.25-1.50	0.2-2	0.07-0.09	0.0-3.0	0.0-0.5	.10	.24			
	43-80	10-20	1.25-1.50	2-6	0.05-0.09	0.0-3.0	0.0-0.5	.10	.32			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
553:												
Haplustalfs	0-5	8-25	1.25-1.50	0.6-6	0.03-0.09	0.0-3.0	1.0-3.0	.10	.28	2	8	0
	5-17	25-45	1.25-1.40	0.06-6	0.04-0.11	0.0-6.0	0.0-0.5	.10	.28			
	17-80	15-40	1.25-1.40	0.06-6	0.04-0.11	0.0-3.0	0.0-0.5	.10	.32			
Ustorthents	0-3	10-20	1.25-1.35	0.6-6	0.05-0.07	0.0-3.0	0.0-1.0	.10	.28	3	8	0
	3-8	15-25	1.25-1.35	0.6-6	0.05-0.07	0.0-3.0	0.0-1.0	.10	.37			
	8-18	---	---	0.0000-0.2	---	---	---	---	---			
560:												
Herm	0-4	15-25	1.15-1.25	0.6-2	0.16-0.18	0.0-2.9	1.0-2.0	.37	.37	5	6	48
	4-11	15-25	1.20-1.30	0.6-2	0.17-0.19	0.0-2.9	0.5-1.0	.37	.37			
	11-16	35-45	1.35-1.40	0.06-0.2	0.19-0.21	6.0-8.9	0.0-0.5	.37	.37			
	16-24	35-45	1.40-1.50	0.06-0.2	0.16-0.18	6.0-8.9	0.0-0.5	.28	.28			
	24-80	27-40	1.25-1.40	0.06-0.6	0.17-0.21	3.0-8.9	0.0-0.5	.28	.28			
Dulcepeak	0-5	12-22	1.25-1.50	0.6-6	0.10-0.13	0.0-3.0	1.0-3.0	.15	.28	3	3	86
	5-20	36-55	1.15-1.30	0.06-0.2	0.14-0.16	6.0-9.0	0.0-0.5	.17	.17			
	20-26	35-40	1.25-1.40	0.06-0.6	0.13-0.16	3.0-6.0	0.0-0.5	.15	.28			
	26-36	---	---	0.2-2	---	---	---	---	---			
571:												
Orlie	0-2	20-27	1.10-1.20	0.6-2	0.16-0.18	0.0-2.9	2.0-3.0	.37	.37	5	6	48
	2-22	28-35	1.40-1.50	0.2-0.6	0.19-0.21	3.0-5.9	0.7-0.9	.37	.37			
	22-80	28-35	1.40-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.1-0.3	.37	.37			
Cementlake	0-1	5-15	1.35-1.50	0.6-2	0.10-0.17	0.0-3.0	0.0-0.5	.28	.28	5	3	86
	1-17	35-50	1.25-1.40	0.06-0.2	0.13-0.17	6.0-9.0	0.0-0.8	.17	.17			
	17-32	27-40	1.25-1.40	0.06-6	0.17-0.21	3.0-6.0	0.0-0.5	.28	.28			
	32-80	27-40	1.15-1.40	0.06-0.6	0.13-0.18	3.0-9.0	0.0-0.5	.24	.24			
580:												
Archmesa	0-10	12-22	1.25-1.40	0.6-6	0.14-0.18	0.0-3.0	1.0-3.0	.28	.28	3	5	56
	10-35	25-35	1.25-1.40	0.2-0.6	0.17-0.21	3.0-6.0	0.0-0.5	.28	.28			
	35-45	---	---	0.0000-0.01	---	---	---	---	---			
Skyute	0-9	10-18	1.25-1.40	0.6-6	0.14-0.18	0.0-3.0	1.0-3.0	.28	.28	2	5	56
	9-17	20-35	1.25-1.40	0.2-0.6	0.17-0.21	3.0-6.0	0.0-0.5	.28	.37			
	17-27	---	---	0.0000-0.01	---	---	---	---	---			
590:												
Abreu Family	0-6	15-22	1.25-1.40	0.6-6	0.07-0.09	0.0-3.0	1.0-3.0	.10	.28	5	8	0
	6-41	27-35	1.25-1.40	0.2-0.6	0.09-0.11	0.0-3.0	0.5-1.0	.10	.24			
	41-80	20-27	1.25-1.40	0.6-2	0.07-0.09	0.0-3.0	0.0-0.5	.10	.24			
Rubbleland	---	---	---	---	---	---	---	---	---	---	8	0
Rock Outcrop	0-80	---	---	---	---	---	---	---	---	---	8	0
600:												
Haplustepts	0-5	10-20	1.25-1.50	0.6-6	0.10-0.13	0.0-3.0	1.0-3.0	.10	.28	3	8	0
	5-43	10-20	1.25-1.50	0.6-6	0.10-0.13	0.0-3.0	0.5-1.0	.20	.37			
	43-53	---	---	0.2-2	---	---	---	---	---			

Table 17.--Physical Properties of the soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
600:												
Haplustalfs	0-4	10-20	1.35-1.50	0.6-6	0.07-0.10	0.0-3.0	1.0-3.0	.10	.15	4	8	0
	4-14	35-40	1.25-1.40	0.06-0.2	0.07-0.09	3.0-6.0	0.5-1.0	.05	.17			
	14-80	20-30	1.25-1.40	0.6-2	0.07-0.09	3.0-6.0	0.0-0.5	.10	.24			

Table 18.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5:							
Water	---	---	---	---	---	---	---
6:							
Miscellaneous Water	---	---	---	---	---	---	---
10:							
Elias	0-1	3.0-10	7.4-7.8	0-5	0	0.0-2.0	0-4
	1-10	10-25	8.5-9.0	0-5	0	0.0-4.0	13-30
	10-36	2.0-10	8.5-9.7	0-3	0	4.0-16.0	13-30
	36-80	2.0-10	8.5-9.5	0-3	0	2.0-8.0	13-30
Canyada	0-1	25-50	7.4-9.0	0-5	0	0.0-2.0	1-5
	1-16	25-50	7.4-9.0	0-5	0	0.0-2.0	5-10
	16-41	5.0-10	7.4-9.0	0-5	0	0.0-2.0	5-10
	41-80	2.0-5.0	7.4-9.0	0-5	0	0.0-2.0	0-10
Sparank	0-3	15-30	7.9-9.0	0-5	0-2	0.0-4.0	5-10
	3-14	25-40	7.9-9.0	0-5	0-2	0.0-4.0	5-10
	14-44	20-35	7.9-9.0	0-5	0-2	0.0-4.0	5-10
	44-60	25-40	7.9-9.0	0-5	0-2	0.0-4.0	5-10
	60-80	15-25	7.9-9.0	0-5	0-2	0.0-4.0	5-10
13:							
Doakum	0-4	3.0-10	6.6-7.3	0	0	0.0-2.0	0
	4-12	10-25	6.6-7.3	0	0	0.0-2.0	0
	12-53	5.0-15	7.4-7.8	0-10	0	0.0-4.0	5-10
	53-80	2.0-10	7.4-8.4	0-10	0	0.0-4.0	5-10
Betonnie	0-4	5.0-10	6.6-7.8	0-5	0	0.0-2.0	0-5
	4-17	5.0-10	6.6-7.8	0-5	0	0.0-2.0	0-5
	17-50	5.0-10	6.6-7.8	1-5	0	0.0-2.0	0-5
	50-80	1.0-10	6.6-7.8	0-5	0	0.0-2.0	0
18:							
Sparham	0-2	25-30	7.4-9.0	0-5	0	2.0-4.0	5-10
	2-80	20-30	7.4-9.0	5-10	0	2.0-4.0	5-10
19:							
Sparham	0-9	10-15	7.4-9.0	0-5	0	2.0-4.0	5-10
	9-80	20-30	7.4-9.0	5-10	0	2.0-4.0	5-10
20:							
Menefee	0-3	15-20	7.4-8.4	5-10	0	0.0-2.0	0
	3-9	15-20	7.4-8.4	10-15	0	0.0-2.0	0-5
	9-21	---	---	---	---	---	---
Vessilla	0-1	5.0-10	6.6-8.4	1-5	0-1	0.0-2.0	0-1
	1-9	5.0-10	6.6-8.4	1-5	0-1	0.0-2.0	0-1
	9-19	---	---	---	---	---	---
Rock Outcrop	0-80	---	---	---	---	---	---

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
21:							
Badland	0-80	---	---	---	---	---	---
Menefee	0-2	15-20	7.4-8.4	5-10	0	0.0-2.0	0
	2-8	15-20	7.4-8.4	10-15	0	0.0-2.0	0-10
	8-18	---	---	---	---	---	---
Rock Outcrop	0-80	---	---	---	---	---	---
23:							
Teromote	0-19	10-25	6.6-8.4	0-5	0	0.0-2.0	0
	19-40	5.0-20	6.6-8.4	0-5	0	0.0-2.0	0-5
	40-80	15-25	6.6-8.4	0-5	0	0.0-2.0	0-5
24:							
Orlie	0-2	10-20	6.6-7.3	0	0	0.0-2.0	0-5
	2-25	20-25	6.6-8.4	0-5	0	0.0-2.0	0-5
	25-80	20-20	7.4-8.4	5-10	0	2.0-4.0	0-5
Sparham	0-3	25-30	7.4-9.0	0-5	0	2.0-4.0	5-10
	3-80	20-30	7.4-9.0	5-10	0	2.0-4.0	5-10
32:							
Doakum	0-4	3.0-10	6.6-7.3	0	0	0.0-2.0	0
	4-12	10-25	6.6-7.3	0	0	0.0-2.0	0
	12-53	5.0-15	7.4-7.8	0-10	0	0.0-4.0	5-10
	53-80	2.0-10	7.4-8.4	0-10	0	0.0-4.0	5-10
40:							
Parkelei	0-2	10-15	6.6-7.3	0	0	0.0-1.0	0
	2-38	15-20	6.6-7.8	0	0	0.0-1.0	0
	38-80	10-15	7.4-7.8	5-10	0	0.0-2.0	0
Menefee	0-3	15-20	7.4-8.4	5-10	0	0.0-2.0	0-5
	3-9	15-20	7.4-8.4	10-15	0	0.0-2.0	0-5
	9-19	---	---	---	---	---	---
Vessilla	0-3	5.0-10	6.6-8.4	1-5	0-1	0.0-2.0	0-1
	3-17	5.0-10	6.6-8.4	1-5	0-1	0.0-2.0	0-1
	17-27	---	---	---	---	---	---
64:							
Dula	0-11	15-20	6.6-7.3	0	0	0.0-2.0	0
	11-28	15-20	6.6-7.3	0	0	0.0-2.0	0
	28-80	1.0-1.0	6.6-7.3	0	0	0.0-2.0	0
69:							
Pinavetes	0-2	1.0-10	6.6-8.4	0-5	0	0.0-1.0	0
	2-80	1.0-5.0	6.6-8.4	1-5	0	0.0-1.0	0
Florita	0-31	5.0-10	6.6-7.3	0	0	0.0-2.0	0
	31-41	3.0-10	6.6-7.8	0	0	0.0-2.0	0
	41-80	4.0-10	6.6-7.8	0-5	0	0.0-2.0	1-5

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
70:							
Blancot	0-7	5.0-15	7.9-8.4	0-5	0	0.0-2.0	0-5
	7-26	15-30	7.4-8.4	1-5	0	0.0-2.0	2-13
	26-80	10-20	7.9-9.0	2-15	0-5	2.0-4.0	5-13
Councelor	0-2	3.0-10	7.9-8.4	2-5	0	0.0-2.0	0-5
	2-32	3.0-15	7.9-9.0	2-5	0	0.0-4.0	0-5
	32-60	2.0-15	7.9-8.4	1-5	0	0.0-4.0	0-5
	60-80	10-15	7.9-8.4	1-5	0	0.0-4.0	0-5
Tsosie	0-2	15-20	7.9-8.4	0-5	0	4.0-8.0	5-10
	2-36	10-20	8.5-9.0	5-10	0	4.0-8.0	5-10
	36-80	10-20	8.5-9.0	5-10	0	4.0-8.0	5-10
104:							
Doakum	0-3	5.0-10	6.1-7.3	0	0	0.0-2.0	0
	3-33	15-30	6.1-7.3	0	0	0.0-2.0	5-10
	33-55	5.0-15	7.9-9.0	2-3	0-1	0.0-8.0	5-10
	55-80	5.0-10	7.4-7.8	2-3	0-1	0.0-2.0	5-10
Oro	0-2	10-20	6.6-7.3	0	0	0.0-2.0	0-5
	2-25	20-35	6.6-7.8	0-10	0	0.0-2.0	0-5
	25-39	0.0-0.0	7.4-7.8	0-10	0	0.0-2.0	0-5
	39-80	2.0-10	7.4-7.8	0-5	0	0.0-2.0	0-5
105:							
Badland	0-80	---	---	---	---	---	---
Menefee	0-4	15-20	7.4-8.4	5-10	0	0.0-2.0	0
	4-10	15-20	7.4-8.4	10-15	0	0.0-2.0	0-5
	10-14	---	---	---	---	---	---
107:							
Berryman	0-3	20-20	7.4-8.4	40-55	0-1	0.0-2.0	0
	3-80	20-20	7.4-8.4	40-55	0-1	0.0-2.0	0
Ruson	0-2	15-25	7.4-8.4	0	0	0.0-2.0	0
	2-19	20-25	7.4-8.4	0	0	0.0-2.0	0
	19-80	25-30	7.4-8.4	0-5	0-5	0.0-4.0	0
108:							
Peney	0-3	10-15	7.4-8.4	10-15	0	0.0-2.0	0
	3-10	10-20	7.4-8.4	15-25	0	0.0-2.0	0
	10-14	---	---	---	---	---	---
Ransect	0-3	20-25	7.4-7.8	10-15	0	0.0-2.0	0
	3-38	15-25	7.4-7.8	40-60	0	0.0-2.0	0
	38-42	---	---	---	---	---	---
115:							
Menefee	0-2	15-20	7.4-8.4	10-15	0	0.0-2.0	0
	2-11	15-20	7.4-8.4	10-15	0-5	0.0-2.0	0-5
	11-15	---	---	---	---	---	---

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
119:							
Roques	0-2	25-30	6.6-7.3	1-5	0	0.0-2.0	0
	2-80	25-35	7.4-7.8	5-10	0-5	0.0-2.0	0-5
Nusmag	0-3	25-30	7.4-7.8	1-5	0	0.0-2.0	0
	3-80	25-35	7.4-8.4	1-10	0-5	0.0-2.0	0-5
136:							
Elpedro	0-3	10-15	7.4-7.8	5-15	0	0.0-2.0	0
	3-80	10-20	7.4-8.4	5-15	0	0.0-2.0	0
155:							
Vessilla	0-1	5.0-10	6.6-8.4	5-10	0	0.0-2.0	0
	1-15	5.0-10	7.4-8.4	5-10	0	0.0-2.0	0
	15-19	---	---	---	---	---	---
Menefee	0-3	20-25	7.4-8.4	5-10	0	0.0-2.0	0
	3-10	15-20	7.4-8.4	10-15	0	0.0-2.0	0-5
	10-14	---	---	---	---	---	---
Orlie	0-4	10-30	7.4-8.4	0	0	0.0-2.0	0
	4-32	10-30	7.4-8.4	0-1	0	0.0-2.0	0
	32-80	10-30	7.4-8.4	1-5	0	0.0-2.0	0
156:							
Lindrith	0-7	15-25	7.9-8.4	0-1	0	0.0-2.0	1-5
	7-60	5.0-15	7.9-9.0	0-1	0	0.0-2.0	1-5
	60-80	5.0-10	8.5-9.0	0-1	0	0.0-2.0	1-5
Royosa	0-2	1.0-10	6.6-7.8	0-1	0	0.0-1.0	0
	2-80	1.0-10	6.6-7.8	0-1	0	0.0-1.0	0
214:							
Quimera	0-3	20-25	6.6-7.8	0	0	1.0-2.0	0
	3-15	20-25	6.6-7.8	5-10	0	1.0-2.0	0
	15-17	25-30	7.9-8.4	5-10	0	1.0-2.0	0
	17-21	---	---	---	---	---	---
Ishkoten	0-3	10-15	6.1-7.3	0	0	0.0-1.0	0
	3-17	20-40	6.1-7.3	0	0	0.0-1.0	0
	17-24	10-30	6.1-7.3	0	0	0.0-1.0	0
	24-34	---	---	---	---	---	---
220:							
Skyvillage	0-4	6.0-12	7.4-8.4	0-5	0	0.0-2.0	0-5
	4-16	6.0-12	7.4-8.4	5-10	0	0.0-2.0	0-5
	16-26	---	---	---	---	---	---
Eslendo	0-13	15-30	7.4-9.0	0-1	0-1	0.0-2.0	0-5
	13-23	---	---	---	---	---	---
Rock Outcrop	0-80	---	---	---	---	---	---

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
229:							
Nusmag	0-2	25-30	7.4-7.8	1-5	0	0.0-2.0	0
	2-18	25-35	7.4-8.4	1-10	0	0.0-2.0	0
	18-80	25-35	7.4-8.4	1-10	0	0.0-4.0	0
Tottles	0-6	20-25	7.4-8.4	5-10	0	0.0-2.0	0
	6-21	25-30	7.4-8.4	5-10	0	0.0-2.0	0
	21-80	25-35	7.4-8.4	5-10	0-2	0.0-2.0	0
231:							
Sparham	0-2	20-25	7.4-9.0	1-10	0	8.0-16.0	1-12
	2-35	20-35	7.4-9.0	5-15	0-2	8.0-16.0	13-30
	35-80	25-35	7.4-9.0	5-15	0-2	8.0-16.0	13-30
303:							
Orlie	0-2	15-25	6.6-7.3	0	0	0.0-2.0	0-5
	2-22	20-25	6.6-8.4	0-5	0	0.0-2.0	0-5
	22-80	20-20	7.4-8.4	5-10	0	2.0-4.0	0-5
304:							
Orlie	0-3	15-25	6.6-7.3	0	0	0.0-2.0	0
	3-35	20-25	6.6-8.4	0-5	0	0.0-2.0	0
	35-80	20-20	7.4-8.4	5-10	0	0.0-4.0	0-5
Nalivag	0-3	15-25	6.6-7.8	0-2	0	0.0-2.0	0
	3-10	10-25	6.6-7.8	1-5	0	0.0-2.0	0-5
	10-39	10-20	7.4-7.8	1-5	0	0.0-2.0	0-5
	39-80	10-25	7.4-7.8	1-5	0	0.0-2.0	0-5
310:							
Rock Outcrop	0-80	---	---	---	---	---	---
Vessilla	0-12	5.0-10	6.6-8.4	1-5	0-1	0.0-2.0	0-1
	12-22	---	---	---	---	---	---
Menefee	0-2	10-20	7.4-8.4	5-10	0	0.0-2.0	0-5
	2-6	15-20	7.4-8.4	10-15	0	0.0-2.0	0-5
	6-16	---	---	---	---	---	---
340:							
Riverwash	0-6	---	---	---	---	---	---
	6-80	---	---	---	---	---	---
Kwakina	0-2	3.0-9.0	7.4-8.4	1-5	0	0.0-4.0	0-5
	2-80	3.0-9.0	7.4-8.4	1-5	0	0.0-4.0	0-5
Tapicito	0-3	3.0-10	7.4-8.4	0-5	0	0.0-4.0	0-10
	3-39	2.0-10	7.4-8.4	0-5	0	0.0-8.0	0-10
	39-80	2.0-5.0	7.4-8.4	0-5	0	0.0-8.0	0-10
350:							
Hosta	0-2	10-25	7.4-7.8	0-3	0	0.0-2.0	0-5
	2-27	20-35	7.4-8.4	0-3	0	0.0-2.0	0-5
	27-80	10-30	7.4-8.4	0-5	0-2	0.0-2.0	0-5

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
370:							
Orlie	0-3	10-30	7.4-8.4	0	0	0.0-2.0	0
	3-18	10-30	7.4-8.4	0-1	0	0.0-2.0	0
	18-80	10-30	7.4-8.4	1-5	0	0.0-2.0	0
380:							
Teequee	0-2	10-25	6.6-7.3	0	0	0.0-2.0	0
	2-51	25-45	6.6-7.8	0-5	0	0.0-2.0	0
	51-61	---	---	---	---	---	---
Menefee	0-2	20-25	7.4-8.4	5-10	0	0.0-2.0	0
	2-10	15-20	7.4-8.4	10-15	0	0.0-2.0	0-5
	10-14	---	---	---	---	---	---
Vessilla	0-2	5.0-10	6.6-8.4	5-10	0	0.0-2.0	0
	2-10	5.0-10	7.4-8.4	5-10	0	0.0-2.0	0
	10-14	---	---	---	---	---	---
390:							
Losindios	0-2	5.0-20	6.1-7.3	0	0	0.0-1.0	0
	2-37	10-20	6.1-7.3	0	0	0.0-1.0	0
	37-80	4.0-15	6.1-7.3	0	0	0.0-1.0	0
Escrito	0-4	7.0-20	6.6-7.3	0	0	0.0-2.0	0
	4-16	10-15	6.6-7.3	0	0	0.0-2.0	0
	16-26	---	---	---	---	---	---
Parkelei	0-2	10-15	6.6-7.3	0	0	0.0-1.0	0
	2-38	15-20	6.6-7.8	0	0	0.0-1.0	0
	38-80	10-15	7.4-7.8	5-10	0	0.0-1.0	0
403:							
Vosburg	0-3	10-20	6.6-7.3	0	0	0.0-2.0	0
	3-25	20-35	6.1-7.3	0-1	0	0.0-2.0	0
	25-35	15-30	6.6-7.8	1-5	0	0.0-2.0	0
	35-80	15-30	6.6-7.8	5-10	0	0.0-2.0	0
Millpaw	0-3	10-30	6.6-7.8	0-1	0	0.0-2.0	0
	3-23	20-40	6.6-7.8	0-1	0	0.0-2.0	0
	23-80	15-30	7.4-8.4	1-5	0	0.0-2.0	0
421:							
Argiustolls	0-23	10-20	6.6-7.3	0	0	0.0-2.0	0
	23-40	25-40	6.6-7.3	0	0	0.0-2.0	0
	40-80	15-35	6.6-7.8	0-5	0	0.0-2.0	0
Ustorthents	0-4	5.0-15	6.6-7.3	0	0	0.0-2.0	0
	4-16	5.0-15	6.6-7.3	0-5	0	0.0-2.0	0
	16-32	5.0-15	6.6-7.8	0-5	0	0.0-2.0	0
	32-42	---	---	---	---	---	---
Rock Outcrop	0-80	---	---	---	---	---	---

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
430:							
Wilmac, dry	0-3	10-20	6.6-7.3	0	0	0.0-2.0	0
	3-11	15-20	6.6-7.8	0	0	0.0-2.0	0
	11-26	15-30	6.6-7.8	0-5	0-5	0.0-4.0	0-5
	26-36	---	---	---	---	---	---
Hosta	0-4	10-25	6.6-7.8	0	0	0.0-2.0	0
	4-17	20-35	6.6-7.8	0-5	0	0.0-2.0	0
	17-80	15-35	7.8-8.4	5-15	0	0.0-2.0	0
440:							
Losindios	0-2	5.0-20	6.1-7.3	0	0	0.0-1.0	0
	2-37	10-20	6.1-7.3	0	0	0.0-1.0	0
	37-80	4.0-15	6.1-7.3	0	0	0.0-1.0	0
Jaythree	0-2	5.0-20	6.1-7.3	0	0	0.0-1.0	0
	2-24	10-25	6.1-7.3	0	0	0.0-1.0	0
	24-80	4.0-15	6.1-7.3	0	0	0.0-1.0	0
452:							
Gojiya	0-50	25-50	7.9-8.4	0-5	0-5	0.0-4.0	0-10
	50-80	15-50	7.9-8.4	0-15	1-5	2.0-10.0	0-10
500:							
Escrito	0-6	5.0-15	6.6-7.3	0	0	0.0-1.0	0
	6-16	4.0-15	6.6-7.3	0	0	0.0-1.0	0
	16-26	---	---	---	---	---	---
Rock Outcrop	0-80	---	---	---	---	---	---
Dulcepeak	0-12	5.0-20	6.1-7.3	0	0	0.0-1.0	0
	12-25	25-45	6.6-7.3	0	0	0.0-1.0	0
	25-35	---	---	---	---	---	---
501:							
Zau	0-13	10-20	6.6-7.3	0	0	0.0-2.0	0-1
	13-16	10-20	6.6-7.3	0	0	0.0-2.0	0-1
	16-21	25-40	6.6-7.3	0	0	0.0-2.0	0-1
	21-48	---	---	---	---	---	---
Lomapedro	0-20	5.0-20	6.6-7.3	0	0	0.0-2.0	0
	20-26	15-30	6.1-7.3	0	0	0.0-2.0	0
	26-37	25-40	6.1-7.3	0	0	0.0-2.0	0
	37-52	25-40	6.1-7.8	0-2	0	0.0-2.0	0
	52-62	---	---	---	---	---	---
515:							
Ustorthents	0-28	4.0-15	7.4-8.4	0-5	0	0.0-2.0	0-5
	28-38	---	---	---	---	---	---
Rock Outcrop	0-80	---	---	---	---	---	---

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
523:							
Suposo	0-3	30-40	6.6-7.3	0	0	0.0-2.0	0-1
	3-11	30-40	6.6-7.3	0	0	0.0-2.0	0-1
	11-50	30-40	6.6-7.8	0-5	0	0.0-2.0	0-1
	50-80	30-40	6.6-7.8	5-10	0	0.0-2.0	0-1
Ohwiler	0-7	30-40	6.1-7.3	0	0	0.0-2.0	0-1
	7-22	20-30	6.6-7.3	0	0	0.0-2.0	0-1
	22-62	20-30	6.6-7.8	0-3	0	0.0-2.0	0-1
	62-80	20-30	7.4-8.4	0-5	0	0.0-2.0	0-1
524:							
Jicarilla	0-3	15-30	6.6-7.3	0	0	0.0-1.0	0
	3-32	25-45	6.6-7.3	0	0	0.0-1.0	0
	32-42	20-40	6.6-7.3	0-5	0-3	0.0-2.0	0
	42-80	15-40	6.6-7.8	0-5	0-3	0.0-2.0	0
Ohwiler	0-7	30-40	6.1-7.3	0	0	0.0-1.0	0-1
	7-22	20-30	6.6-7.3	0	0	0.0-1.0	0-1
	22-62	20-30	6.6-7.8	0-3	0	0.0-1.0	0-1
	62-80	20-30	7.4-8.4	0-3	0	0.0-1.0	0-1
525:							
Jaythree	0-2	5.0-20	6.1-7.3	0	0	0.0-1.0	0
	2-24	10-25	6.1-7.3	0	0	0.0-1.0	0
	24-80	4.0-15	6.1-7.3	0	0	0.0-1.0	0
Cedarsprings	0-9	10-30	6.1-7.3	0	0	0.0-1.0	0
	9-19	20-50	6.1-7.3	0	0	0.0-1.0	0
	19-42	20-50	6.1-7.3	0	0	0.0-1.0	0
	42-80	10-35	6.1-7.3	0	0	0.0-1.0	0
526:							
Hetz	0-18	15-25	7.3-8.4	0-5	0	0.0-2.0	0
	18-60	10-25	7.3-8.4	0-5	0	0.0-2.0	0
	60-80	10-20	7.3-8.4	0-10	0	0.0-2.0	0
530:							
Wilmac	0-3	10-20	6.6-7.3	0	0	0.0-2.0	0
	3-16	15-20	6.6-7.8	0	0	0.0-2.0	0
	16-38	15-30	7.8-8.4	0-10	0-5	0.0-4.0	0-5
	38-48	---	---	---	---	---	---
Hosta	0-2	10-25	7.4-7.8	0-3	0	0.0-2.0	0-4
	2-27	20-35	7.4-8.4	0-3	0	0.0-2.0	0-4
	27-72	20-30	7.4-8.4	0-3	0-5	0.0-2.0	0-4
	72-80	20-30	7.4-8.4	0-3	0	0.0-2.0	0-4
Millpaw	0-2	10-30	6.6-7.8	0-1	0	0.0-2.0	0
	2-21	20-40	6.6-7.8	0-1	0	0.0-2.0	0
	21-83	20-35	7.4-8.4	1-5	0	0.0-2.0	0

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
531:							
Horselake	0-3	20-30	6.6-7.3	0	0	0.0-2.0	0
	3-22	25-50	6.6-7.8	0-5	0	0.0-2.0	0
	22-31	20-50	7.8-8.4	0-10	0-5	0.0-2.0	0-5
	31-36	15-35	7.8-8.4	0-10	0-5	0.0-2.0	0-5
	36-46	---	---	---	---	---	---
Menefee	0-2	15-20	7.4-8.4	5-10	0	0.0-2.0	0
	2-8	15-20	7.4-8.4	10-15	0	0.0-2.0	0
	8-22	---	---	---	---	---	---
533:							
Badland	0-80	---	---	---	---	---	---
540:							
Ishkoten	0-6	10-15	6.1-7.3	0	0	0.0-1.0	0
	6-22	20-40	6.1-7.3	0	0	0.0-1.0	0
	22-34	10-30	6.1-7.3	0	0	0.0-1.0	0
	34-44	---	---	---	---	---	---
Lajuita	0-3	5.0-15	6.1-7.3	0	0	0.0-1.0	0
	3-11	10-20	6.8-7.3	0	0	0.0-1.0	0
	11-21	---	---	---	---	---	---
Escrito	0-5	7.0-20	6.6-7.3	0	0	0.0-1.0	0
	5-17	10-15	6.6-7.3	0	0	0.0-1.0	0
	17-27	---	---	---	---	---	---
541:							
Ishkoten	0-6	10-15	6.1-7.3	0	0	0.0-1.0	0
	6-13	20-40	6.1-7.3	0	0	0.0-1.0	0
	13-28	10-30	6.1-7.3	0	0	0.0-1.0	0
	28-38	---	---	---	---	---	---
Lajuita	0-3	5.0-15	6.1-7.3	0	0	0.0-1.0	0
	3-10	10-20	6.8-7.3	0	0	0.0-1.0	0
	10-20	---	---	---	---	---	---
552:							
Haplustalfs	0-5	5.0-20	6.6-7.3	0	0	0.0-1.0	0
	5-60	10-20	6.6-7.3	0	0	0.0-1.0	0
	60-80	4.0-15	6.6-7.3	0	0	0.0-1.0	0
Argiustolls	0-3	5.0-20	6.6-7.3	0	0	0.0-1.0	0
	3-22	10-20	6.6-7.3	0	0	0.0-1.0	0
	22-43	10-20	6.6-7.3	0	0	0.0-1.0	0
	43-80	5.0-15	6.6-7.3	0	0	0.0-1.0	0
553:							
Haplustalfs	0-5	5.0-20	6.6-7.3	0	0	0.0-1.0	0
	5-17	10-40	6.6-7.3	0	0	0.0-1.0	0
	17-80	5.0-25	6.6-7.8	0-5	0	0.0-1.0	0
Ustorthents	0-3	4.0-15	6.6-8.4	0-5	0	0.0-2.0	0
	3-8	4.0-15	6.6-8.4	0-5	0	0.0-2.0	0
	8-18	---	---	---	---	---	---

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
560:							
Herm	0-4	10-20	6.6-7.3	0	0	0.0-1.0	0
	4-11	10-15	6.6-7.3	0	0	0.0-1.0	0
	11-16	20-30	6.6-7.8	0	0	0.0-1.0	0
	16-24	20-30	6.6-7.8	0	0	0.0-1.0	0
	24-80	10-25	6.6-7.8	0	0	0.0-1.0	0
Dulcepeak	0-5	5.0-20	6.6-7.3	0	0	0.0-1.0	0
	5-20	25-45	6.6-7.3	0	0	0.0-1.0	0
	20-26	15-35	6.6-7.3	0	0	0.0-1.0	0
	26-36	---	---	---	---	---	---
571:							
Orlie	0-2	15-25	6.6-7.3	0	0	0.0-2.0	0-5
	2-22	20-25	6.6-8.4	0-5	0	0.0-2.0	0-5
	22-80	20-20	7.4-8.4	5-10	0	2.0-4.0	0-5
Cementlake	0-1	4.0-10	7.3-8.4	0-5	0	0.0-4.0	13-30
	1-17	20-40	7.3-8.4	0-5	0-5	0.0-4.0	13-45
	17-32	10-25	7.3-8.4	0-5	0-5	0.0-8.0	13-45
	32-80	10-30	7.3-8.4	0-10	0-10	0.0-8.0	5-45
580:							
Archmesa	0-10	5.0-20	6.6-7.3	0	0	0.0-1.0	0
	10-35	10-20	6.6-7.3	0	0	0.0-1.0	0
	35-45	---	---	---	---	---	---
Skyute	0-9	5.0-20	6.6-7.3	0	0	0.0-1.0	0
	9-17	10-20	6.6-7.3	0	0	0.0-1.0	0
	17-27	---	---	---	---	---	---
590:							
Abreu Family	0-6	10-20	6.1-7.3	0	0	0.0-1.0	0
	6-41	10-25	6.1-7.3	0	0	0.0-1.0	0
	41-80	10-15	6.1-7.3	0	0	0.0-1.0	0
Rubbleland	---	---	---	---	---	---	---
Rock Outcrop	0-80	---	---	---	---	---	---
600:							
Haplustepts	0-5	5.0-20	6.6-7.3	0	0	0.0-1.0	0
	5-43	5.0-20	6.6-7.3	0	0	0.0-1.0	0
	43-53	---	---	---	---	---	---
Haplustalfs	0-4	10-20	6.6-7.3	0	0	0	0
	4-14	15-25	6.6-7.3	0	0	0	0
	14-80	10-20	6.6-7.3	0-3	0	0	0

Table 19.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
5:					
Water	---				
		All months	---	---	---
10:					
Elias	C				
		July	---	Very brief	Rare
		August	---	Very brief	Rare
		September	---	Very brief	Rare
Canyada	D				
		July	---	Very brief	Rare
		August	---	Very brief	Rare
		September	---	Very brief	Rare
Sparank	D				
		March	---	Very brief	Rare
		April	---	Very brief	Rare
		May	---	Very brief	Rare
		June	---	Very brief	Rare
		July	---	Very brief	Rare
		August	---	Very brief	Rare
13:					
Doakum	B				
		All months	---	---	---
Betonnie	B				
		All months	---	---	---
18:					
Sparham	D				
		July	---	Brief	Occasional
		August	---	Brief	Occasional
		September	---	Brief	Occasional
		October	---	Brief	Occasional
19:					
Sparham	D				
		July	---	Brief	Occasional
		August	---	Brief	Occasional
		September	---	Brief	Occasional
		October	---	Brief	Occasional
20:					
Menefee	D				
		All months	---	---	---
Vessilla	D				
		All months	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
20:					
Rock Outcrop	D				
		All months	---	---	---
21:					
Badland	D				
		All months	---	---	---
Menefee	D				
		All months	---	---	---
Rock Outcrop	D				
		All months	---	---	---
24:					
Orlie	C				
		All months	---	---	---
Sparham	D				
		July	---	Brief	Rare
		August	---	Brief	Rare
		September	---	Brief	Rare
		October	---	Brief	Rare
32:					
Doakum	B				
		All months	---	---	---
40:					
Parkelei	B				
		All months	---	---	---
Menefee	D				
		All months	---	---	---
Vessilla	D				
		All months	---	---	---
64:					
Dula	D				
		April	1.0-3.5	Brief	Frequent
		May	1.0-3.5	Brief	Frequent
		June	1.0-3.5	Brief	Frequent
		July	1.0-3.5	Brief	Frequent
		August	1.0-3.5	Brief	Frequent
69:					
Pinavetes	A				
		All months	---	---	---
Florita	B				
		All months	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
70:					
Blancot	B				
		All months	---	---	---
Councelor	B				
		All months	---	---	---
Tsosie	B				
		All months	---	---	---
104:					
Doakum	B				
		All months	---	---	---
Oro	C				
		All months	---	---	---
105:					
Badland	D				
		All months	---	---	---
Menefee	D				
		All months	---	---	---
107:					
Berryman	C				
		All months	---	---	---
Ruson	C				
		All months	---	---	---
108:					
Peney	D				
		All months	---	---	---
Ransect	C				
		All months	---	---	---
115:					
Menefee	D				
		All months	---	---	---
119:					
Roques	D				
		All months	---	---	---
Nusmag	D				
		March	3.5-6.0	---	---
		April	3.5-6.0	---	---
		May	3.5-6.0	---	---
		June	3.5-6.0	---	---
136:					
Elpedro	B				
		All months	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
155:					
Vessilla	D				
		All months	---	---	---
Menefee	D				
		All months	---	---	---
Orlie	C				
		All months	---	---	---
156:					
Lindrith	B				
		All months	---	---	---
Royosa	A				
		All months	---	---	---
214:					
Quimera	C				
		All months	---	---	---
Ishkoten	B				
		All months	---	---	---
220:					
Skyvillage	D				
		All months	---	---	---
Eslendo	D				
		All months	---	---	---
Rock Outcrop	D				
		All months	---	---	---
229:					
Nusmag	D				
		March	3.5-6.0	---	---
		April	3.5-6.0	---	---
		May	3.5-6.0	---	---
		June	3.5-6.0	---	---
Tottles	C				
		March	0.5-3.0	---	---
		April	0.5-3.0	---	---
		May	0.5-3.0	---	---
		June	0.5-3.0	---	---
231:					
Sparham	D				
		July	---	Brief	Rare
		August	---	Brief	Rare
		September	---	Brief	Rare
		October	---	Brief	Rare

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
303:					
Orlie	C				
		All months	---	---	---
304:					
Orlie	C				
		All months	---	---	---
Nalivag	B				
		All months	---	---	---
310:					
Vessilla	D				
		All months	---	---	---
Menefee	D				
		All months	---	---	---
340:					
Riverwash	D				
		July	---	Very brief	Frequent
		August	---	Very brief	Frequent
		September	---	Very brief	Frequent
		October	0.0-2.0	Very brief	Frequent
Kwakina	A				
		July	5.0	Brief	Occasional
		August	5.0	Brief	Occasional
		September	5.0	Brief	Occasional
		October	5.0	Brief	Occasional
Tapicito	B				
		July	---	Brief	Rare
		August	---	Brief	Rare
		September	---	Brief	Rare
		October	---	Brief	Rare
350:					
Hosta	C				
		All months	---	---	---
370:					
Orlie	C				
		All months	---	---	---
380:					
Teequee	D				
		All months	---	---	---
Menefee	D				
		All months	---	---	---
Vessilla	D				
		All months	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
390:					
Losindios	B				
		All months	---	---	---
Escrito	D				
		All months	---	---	---
Parkelei	B				
		All months	---	---	---
403:					
Vosburg	B				
		All months	---	---	---
Millpaw	C				
		All months	---	---	---
421:					
Argiustolls	C				
		All months	---	---	---
Ustorthents	C				
		All months	---	---	---
430:					
Wilmac, dry	C				
		All months	---	---	---
Hosta	C				
		All months	---	---	---
452:					
Gojiya	D				
		March	4.2-6.7	---	---
		April	4.2-6.7	---	---
		May	4.2-6.7	---	---
		June	4.2-6.7	---	---
		July	---	---	---
		August	---	---	---
		September	---	---	---
		October	---	---	---
500:					
Escrito	D				
		All months	---	---	---
Rock Outcrop	D				
		All months	---	---	---
Dulcepeak	C				
		All months	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
501:					
Zau	C				
		All months	---	---	---
Lomapedro	C				
		All months	---	---	---
515:					
Ustorthents	B				
		All months	---	---	---
Rock Outcrop	D				
		All months	---	---	---
523:					
Suposo	C				
		All months	---	---	---
Ohwiler	B				
		All months	---	---	---
524:					
Jicarilla	C				
		March	1.6-3.3	---	---
		April	1.6-3.3	Brief	Rare
		May	1.6-3.3	---	---
		June	1.6-3.3	---	---
Ohwiler	B				
		All months	---	---	---
525:					
Jaythree	B				
		All months	---	---	---
Cedarsprings	D				
		All months	---	---	---
526:					
Hetz	B/D				
		March	0.8-3.3	---	---
		April	0.8-3.3	---	---
		May	0.8-3.3	---	---
		June	0.8-3.3	---	---
		July	0.8-3.3	---	---
530:					
Wilmac	C				
		All months	---	---	---
Hosta	C				
		All months	---	---	---
Millpaw	C				
		All months	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
531:					
Horselake	D	All months	---	---	---
Menefee	D	All months	---	---	---
533:					
Badland	D	All months	---	---	---
540:					
Ishkoten	C	All months	---	---	---
Lajuita	D	All months	---	---	---
Escrito	D	All months	---	---	---
541:					
Ishkoten	C	All months	---	---	---
Lajuita	D	All months	---	---	---
552:					
Haplustalfs	B	All months	---	---	---
Argiustolls	B	All months	---	---	---
553:					
Haplustalfs	C	All months	---	---	---
Ustorthents	B	All months	---	---	---
560:					
Herm	C	All months	---	---	---
Dulcepeak	C	All months	---	---	---
571:					
Orlie	C	All months	---	---	---
Cementlake	D	All months	---	---	---

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table upper limit	Flooding	
				Duration	Frequency
580:					
Archmesa	C	All months	---	---	---
Skyute	D	All months	---	---	---
590:					
Abreu Family	B	All months	---	---	---
Rubbleland	A	All months	---	---	---
Rock Outcrop	D	All months	---	---	---
600:					
Haplustepts	C	All months	---	---	---
Haplustalfs	B	All months	---	---	---

Table 20.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
5:					
Water	---	---	---	---	---
6:					
Miscellaneous Water	---	---	---	---	---
10:					
Elias	---	---	Low	High	Low
Canyada	---	---	Low	High	Low
Sparank	---	---	Low	High	Low
13:					
Doakum	---	---	Low	High	Low
Betonnie	---	---	Low	Moderate	Low
18:					
Sparham	---	---	Low	High	Low
19:					
Sparham	---	---	Low	High	Low
20:					
Menefee	Bedrock (paralithic)	9-20	Moderate	High	Low
Vessilla	Bedrock (lithic)	6-20	Low	High	Low
Rock Outcrop	Bedrock (lithic)	0	---	---	---
21:					
Badland	Bedrock (paralithic)	0-3	None	---	---
Menefee	Bedrock (paralithic)	8-20	Moderate	High	Low
Rock Outcrop	Bedrock (lithic)	0	---	---	---
23:					
Teromote	---	---	Moderate	High	Low
24:					
Orlie	---	---	Moderate	High	Low
Sparham	---	---	Low	High	Low
32:					
Doakum	---	---	Low	High	Low

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
40:					
Parkelei	---	---	Moderate	Moderate	Low
Menefee	Bedrock (paralithic)	8-20	Moderate	High	Low
Vessilla	Bedrock (lithic)	6-20	Low	High	Low
64:					
Dula	---	---	High	High	Low
69:					
Pinavetes	---	---	Low	Moderate	Low
Florita	---	---	Low	High	Low
70:					
Blancot	---	---	Low	High	Low
Councelor	---	---	Low	High	Low
Tsosie	---	---	Low	High	Low
104:					
Doakum	---	---	Low	High	Low
Oro	---	---	Low	Moderate	Low
105:					
Badland	Bedrock (paralithic)	0-3	---	---	---
Menefee	Bedrock (paralithic)	8-20	Moderate	High	Moderate
107:					
Berryman	---	---	Moderate	High	Low
Ruson	---	---	Low	High	Low
108:					
Peney	Bedrock (lithic)	10-20	Moderate	Moderate	Low
Ransect	Bedrock (lithic)	20-40	Moderate	High	Low
115:					
Menefee	Bedrock (paralithic)	8-20	Moderate	High	Moderate
119:					
Roques	---	---	Low	High	Low
Nusmag	---	---	Low	High	Low
136:					
Elpedro	---	---	Moderate	High	Low

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
155:					
Vessilla	Bedrock (lithic)	6-20	Low	Moderate	Low
Menefee	Bedrock (paralithic)	8-20	Moderate	High	Low
Orlie	---	---	Moderate	Moderate	Low
156:					
Lindrith	---	---	Moderate	High	Low
Royosa	---	---	Low	Moderate	Low
214:					
Quimera	Bedrock (lithic)	8-20	Low	High	Low
Ishkoten	Bedrock (paralithic)	20-40	Moderate	Moderate	Low
220:					
Skyvillage	Bedrock (lithic)	6-20	Low	Moderate	Low
Eslendo	Bedrock (paralithic)	6-20	Low	High	Low
Rock Outcrop	Bedrock (lithic)	0	---	---	---
229:					
Nusmag	---	---	Low	High	Low
Tottles	---	---	High	High	Low
231:					
Sparham	---	---	Low	High	Moderate
303:					
Orlie	---	---	Moderate	High	Low
304:					
Orlie	---	---	Moderate	High	Low
Nalivag	---	---	Moderate	High	Low
310:					
Rock Outcrop	Bedrock (lithic)	0	---	---	---
Vessilla	Bedrock (lithic)	6-20	Low	High	Low
Menefee	Bedrock (paralithic)	8-20	Moderate	High	Low

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
340:					
Riverwash	---	---	---	---	---
Kwakina	---	---	Low	Moderate	Low
Tapicito	---	---	Low	High	Low
350:					
Hosta	---	---	Moderate	High	Low
370:					
Orlie	---	---	Moderate	High	Low
380:					
Teequee	Bedrock (paralithic)	40-60	Low	Moderate	Low
Menefee	Bedrock (paralithic)	8-20	Moderate	High	Moderate
Vessilla	Bedrock (lithic)	6-20	Low	Moderate	Low
390:					
Losindios	---	---	Moderate	Moderate	Moderate
Escrito	Bedrock (lithic)	10-20	Low	Low	Low
Parkelei	---	---	Moderate	Moderate	Low
403:					
Vosburg	---	---	Moderate	Moderate	Low
Millpaw	---	---	Low	Moderate	Low
421:					
Argiustolls	Bedrock (lithic)	40-80	Moderate	Moderate	Low
Ustorthents	Bedrock (lithic)	20-40	Moderate	Moderate	Low
Rock Outcrop	Bedrock (lithic)	0	---	---	---
430:					
Wilmac, dry	Bedrock (paralithic)	20-40	Moderate	High	Low
Hosta	---	---	Moderate	High	Low
440:					
Losindios	---	---	Moderate	Moderate	Low
Jaythree	---	---	Moderate	Moderate	Low
452:					
Gojiya	---	---	Low	High	Low

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
500:					
Escrito	Bedrock (lithic)	8-20	Low	Low	Low
Rock Outcrop	Bedrock (lithic)	0	---	---	---
Dulcepeak	Bedrock (lithic)	20-39	Low	Moderate	Low
501:					
Zau	Bedrock (paralithic)	20-40	Moderate	Moderate	Low
Lomapedro	Bedrock (paralithic)	50-60	Moderate	Moderate	Low
515:					
Ustorthents	Bedrock (paralithic)	5-40	Moderate	Moderate	Low
Rock Outcrop	Bedrock (lithic)	0	---	---	---
523:					
Suposo	---	---	Moderate	Moderate	Low
Ohwiler	---	---	Moderate	Moderate	Low
524:					
Jicarilla	---	---	High	Moderate	Low
Ohwiler	---	---	Moderate	High	Low
525:					
Jaythree	---	---	Moderate	Moderate	Low
Cedarsprings	---	---	Low	Moderate	Low
526:					
Hetz	---	---	High	High	Low
530:					
Wilmac	Bedrock (paralithic)	20-40	Moderate	High	Low
Hosta	---	---	Moderate	High	Low
Millpaw	---	---	Low	Moderate	Low
531:					
Horselake	Bedrock (paralithic)	20-40	Low	Moderate	Low
Menefee	Bedrock (paralithic)	8-20	Moderate	High	Low
533:					
Badland	Bedrock (paralithic)	0-80	---	---	---

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
540:					
Ishkoten	Bedrock (paralithic)	20-40	Low	Moderate	Low
Lajuita	Bedrock (paralithic)	5-15	Moderate	Moderate	Low
	Bedrock (lithic)	10-20			
Escrito	Bedrock (lithic)	10-20	Low	Low	Low
541:					
Ishkoten	Bedrock (paralithic)	20-40	Low	Moderate	Low
Lajuita	Bedrock (lithic)	10-20	Moderate	Moderate	Low
552:					
Haplustalfs	Bedrock (paralithic)	20-80	Moderate	Moderate	Low
Argiustolls	Bedrock (paralithic)	20-80	Moderate	Moderate	Low
553:					
Haplustalfs	Bedrock (paralithic)	20-80	Moderate	Moderate	Low
Ustorthents	Bedrock (paralithic)	5-40	Moderate	Moderate	Low
560:					
Herm	---	---	Low	Moderate	Low
Dulcepeak	Bedrock (lithic)	20-40	Low	Moderate	Low
571:					
Orlie	---	---	Moderate	High	Low
Cementlake	---	---	Moderate	High	Low
580:					
Archmesa	Bedrock (lithic)	20-40	Moderate	Moderate	Low
Skyute	Bedrock (lithic)	10-20	Moderate	Moderate	Low
590:					
Abreu Family	Bedrock (lithic)	20-80	Moderate	Moderate	Low
Rubbleland	---	---	---	---	---
Rock Outcrop	Bedrock (lithic)	0	---	---	---
600:					
Haplustepts	Bedrock (lithic)	40-80	Moderate	Moderate	Low
Haplustalfs	Bedrock (paralithic)	20-80	Moderate	Moderate	Low

Table 21.--Classification of the Soils

Soil name	Family or higher taxonomic class
Abreu Family	Loamy-skeletal, mixed, superactive, frigid Typic Haplustalfs
Archmesa	Fine-loamy, mixed, superactive, frigid Typic Argiustolls
Argiustolls	Argiustolls
Berryman	Fine-loamy, carbonatic, mesic Haplocalcidic Haplustepts
Betonnie	Coarse-loamy, mixed, superactive, mesic Ustic Haplargids
Blancot	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Canyada	Clayey over loamy, smectitic over mixed, superactive, calcareous, mesic Ustertic Torriorthents
Cedarsprings	Fine, smectitic, frigid Vertic Argiustolls
Cementlake	Fine, smectitic, mesic Aridic Natrustalfs
Councelor	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Doakum	Fine-loamy, mixed, superactive, mesic Ustic Haplargids
Dula	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Cumulic Endoaquolls
Dulcepeak	Fine, smectitic, frigid Vertic Paleustalfs
Elias	Fine-loamy, mixed, superactive, mesic Ustic Natrargids
Elpedro	Fine-silty, mixed, superactive, mesic Aridic Haplustalfs
Escrito	Loamy, mixed, superactive, frigid Lithic Haplustepts
Eslendo	Loamy, mixed, superactive, calcareous, mesic, shallow Ustic Torriorthents
Florita	Coarse-loamy, mixed, superactive, nonacid, mesic Ustic Torriorthents
Gojiya	Fine, smectitic, mesic Torrertic Haplustepts
Haplustalfs	Haplustalfs
Haplustepts	Haplustepts
Hetz	Fine-loamy, mixed, superactive, calcareous, mesic Typic Endoaquolls
Horselake	Fine, smectitic, mesic Vertic Haplustalfs
Hosta	Fine, mixed, superactive, mesic Aridic Haplustalfs
Ishkoten	Fine, smectitic, frigid Typic Haplustalfs
Jaythree	Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
Jicarilla	Fine, smectitic, frigid Typic Argiaquolls
Kwakina	Sandy, mixed, mesic Ustic Torrifluvents
Lajuita	Loamy, mixed, superactive, frigid Lithic Haplustalfs
Lindrith	Coarse-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Lomapedro	Fine, smectitic, frigid Pachic Argiustolls
Losindios	Fine-loamy, mixed, superactive, frigid Typic Haplustalfs
Menefee	Loamy, mixed, superactive, calcareous, mesic, shallow Aridic Ustorthents
Millpaw	Fine, mixed, superactive, mesic Pachic Argiustolls
Nalivag	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustorthents
Nusmag	Fine, smectitic, frigid Vertic Haplustolls
Ohwiler	Fine-loamy, mixed, superactive, frigid Pachic Argiustolls
Orlie	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Oro	Clayey over loamy, smectitic over mixed, superactive, mesic Ustertic Haplargids
Parkelei	Fine-loamy, mixed, superactive, mesic Aridic Haplustalfs
Peney	Loamy, mixed, superactive, mesic Lithic Calciustepts
Pinavetes	Mixed, mesic Ustic Torripsamments
Ransect	Fine-loamy, carbonatic, mesic Haplocalcidic Haplustepts
Roques	Fine, mixed, superactive, frigid Vertic Haplustepts
Royosa	Mixed, mesic Aridic Ustipsamments
Ruson	Fine, mixed, superactive, calcareous, mesic Aridic Ustorthents
Skyute	Loamy, mixed, superactive, frigid Lithic Argiustolls
Skyvillage	Loamy, mixed, superactive, calcareous, mesic Lithic Ustic Torriorthents
Sparank	Fine, mixed, superactive, calcareous, mesic Ustic Torrifluvents
Sparham	Fine, mixed, superactive, calcareous, mesic Aridic Ustifluvents
Suposo	Fine, smectitic, frigid Vertic Argiustolls
Tapicito	Coarse-loamy, mixed, superactive, calcareous, mesic Ustic Torrifluvents
Teequee	Fine, smectitic, mesic Vertic Haplustalfs
Teromote	Fine-loamy, mixed, superactive, mesic Aridic Haplustepts
Tottles	Fine, mixed, superactive, calcareous, frigid Cumulic Vertic Endoaquolls
Tsosie	Fine-loamy, mixed, superactive, calcareous, mesic Ustic Torriorthents
Ustorthents	Ustorthents
Vessilla	Loamy, mixed, active, calcareous, mesic Aridic Lithic Ustorthents
Vosburg	Fine-loamy, mixed, superactive, mesic Pachic Argiustolls
Wilmac	Fine, mixed, superactive, mesic Aridic Haplustalfs
Zau	Fine, smectitic, frigid Typic Argiustolls

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